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BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 18 1952

PULMONARY TUBERCULOSIS IN THE RHONDDA FACH

AN INTERIM REPORT OF A SURVEY OF A MINING COMMUNITY

BY

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The Plan

Although this report is complete in itself, it presents the results of only the first stage of a long-term experiment. Some idea of the whole scheme must be given to explain the purpose of the survey, the reasons for the choice of this particular valley, and the emphasis that has been placed throughout on "infectivity."

The main objective is to investigate the theory that progressive massive fibrosis (P.M.F.) is a tuberculous lesion modified by the presence of coal dust (Gough, 1947; Fletcher, 1948). It is not possible to investigate this hypothesis by means of experiments with animals, as they do not react to coal-dust inhalation in the same way as do men. A large-scale epidemiological experiment was therefore suggested by one of us (A. L. C.), to measure the change of "attack rate" (rate of appearance) of P.M.F. in miners with simple pneumoconiosis when the environment has been made as free from tuberculous infection as possible. In this way the importance of exogenous infection in the aetiology of the disease could be investigated. Clearly, the most difficult task in such a scheme is to reduce tuberculous infection sufficiently in a large area, but the results of community surveys in the U.S.A. by Davies and others (Davies and Scherer, 1939; Davies, 1946; Davies, Hedberg, and Fischer, 1948) suggest that a decided reduction in infection is in fact feasible. The task was therefore undertaken, and is described in this report.

On the initiative of the Welsh Regional Hospital Board and the Pneumoconiosis Research Unit of the Medical Research Council, a Local Medical Advisory Committee was formed, on which all interested medical organizations were represented. A smaller Executive Committee prepared detailed plans and controlled the day-to-day running of the scheme.

Two mobile teams carried out the survey—one from the Welsh Regional Hospital Board (hereafter referred to as the M.M.R. team), which *x*-rayed the women, children of school age, and non-mining males, and one from the Pneumoconiosis Research Unit (hereafter referred to as the P.R.U. team), which *x*-rayed all miners and ex-miners.

The detailed objectives were as follows.

1. *To take x-ray films of as large a percentage of the population as possible.*—Routine mass radiography surveys of communities rarely cover more than 30% of the population concerned. As this proportion was thought to be inadequate for our purpose, lectures were given to special groups in the valley before the survey, and considerable propaganda, including wireless, television, lectures, posters, and home visiting, was planned for the actual period of the survey.

2. *To ensure that so far as possible no infectious case of tuberculosis would be missed.*—To reduce errors of radiological diagnosis (Fletcher and Oldham, 1949, 1951; Garland, 1949; Yerushalmy *et al.*, 1950) it was decided that all films should be read by two observers working separately, and that all cases suspected by either of them of having active tuberculosis should have their sputum investigated.

3. *To reduce the infectivity of those with a positive sputum.*—The Regional Hospital Board, with admirable speed, made two 27-bed wards available for cases of pulmonary tuberculosis living in the area. The P.R.U. provided a full-time health visitor to educate and follow up all such cases remaining at home in the community.

4. *To obtain an estimate of the prevalence of tuberculous infection in the area.*—The M.M.R. team tuberculin-tested the schoolchildren (a report of this work will be published separately).

The Rhondda Fach

Social Background.—The area chosen for the experiment was the Rhondda Fach (the Little Rhondda): it was relatively secluded, the size of its population seemed suited to our purpose and our resources, and pneumoconiosis was very prevalent amongst its numerous miners

and ex-miners; moreover, previous surveys carried out amongst the miners and their families in some of the towns there had met with an enthusiastic response. The Rhondda Fach is a narrow winding valley, with an adult population of about 19,000, lying between the Rhondda Fawr (the big Rhondda) and the Aberdare Valley. At the top of the valley a steep road connects with Aberdare, and half-way down another leads over to the Rhondda Fawr. Eight small towns are grouped around four collieries, which provide employment for most of the men. During the interwar years the valley felt the full

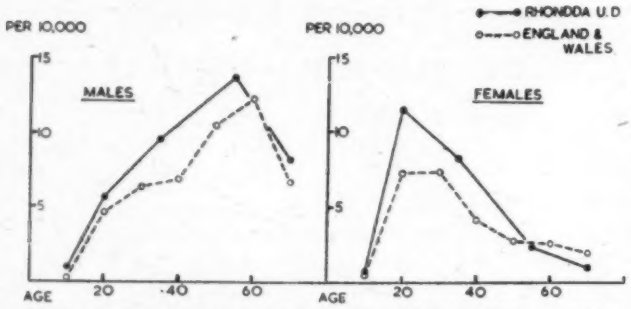

FIG. 1.—Tuberculosis mortality rates for Rhondda Urban District (1946–9) and England and Wales (1947).

effects of unemployment, but from 1940 the levels of employment among those able to work had been high and wage levels had risen and were still rising at the time of the survey.

Epidemiological Background.—Tuberculosis mortality in the Rhondda Urban District over the years 1946–9 is summarized in Fig. 1, where the age and sex specific mortality rates are compared with corresponding rates for the whole of England and Wales in 1947. An indication of the prevalence of pneumoconiosis in the valley is given in Fig. 2, which shows for each year from 1940

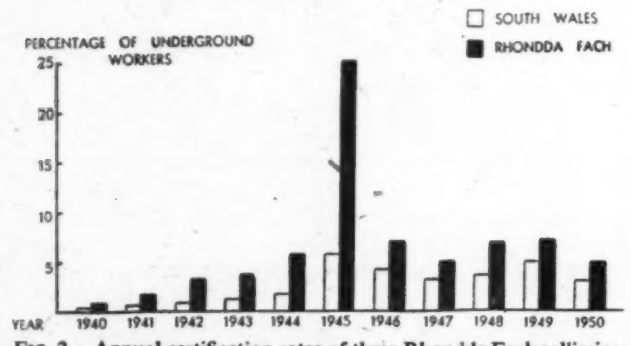

FIG. 2.—Annual certification rates of three Rhondda Fach collieries, compared with the whole of the South Wales coalfield. This histogram shows the considerable increase in certification of pneumoconiosis in South Wales miners since 1945, following the introduction of the pneumoconiosis scheme in July, 1943; and the increased prevalence of disease in the Rhondda Fach over the rest of the coalfield.

to 1950 the percentage of all underground workers in three of the four* mines included in our survey who were either certified under the Workmen's Compensation Act or diagnosed under the National Insurance (Industrial Injuries) Act as suffering from pneumoconiosis, and also the average percentage for all the mines in the South Wales coalfield.† It will be seen that the Rhondda Fach pits appear to have produced more pneumoconiosis than the average of South Wales pits; it is important to bear this in mind in considering the prevalence of pneumoconiosis which we discovered (see below).

*One of the mines has only recently been reopened.
†Including Denbigh, Flint, Gloucester, and Somerset.

General Method of Work

Lectures explaining the scheme were started about nine months before the actual survey. These were given mainly on Sunday evenings in the numerous social and political clubs in each town in the valley. About one month before the scheme started a Press conference was held in Cardiff, as a result of which the scheme received considerable support from the Press, both locally and nationally. At the same time, with the assistance of the National Union of Mineworkers, local committees were set up in each town. A special poster was designed, and propaganda leaflets giving times of *x*-raying, etc., were widely distributed throughout the valley. The B.B.C. provided generous facilities throughout the survey.

The actual *x*-raying was done between September, 1950, and April, 1951, at six centres in the valley. The two teams worked separately in each town, the P.R.U. team usually at the pit-head and the M.M.R. team in chapel vestries or other suitable halls. The names of those *x*-rayed were crossed off the population lists (see below), and when the rate of attendance began to fall off—usually at about the 50% mark—those not *x*-rayed were visited at their homes by members of the teams, a task which proved much more laborious than was expected. In all, more than 20,000 home visits were made during the survey. They appeared to be very effective, but it was impossible to obtain actual proof that they were. Repeat visits were often successful, some obstinate persons agreeing at the sixth attempt. Towards the end of the survey the age and sex of all those who had not been *x*-rayed were determined by further visiting, and in two towns the males who had not been *x*-rayed were divided into miners, ex-miners, and non-miners.

The Total Population

The total population to be *x*-rayed had to be defined in detail both geographically and nominally. Geographically it consisted of those, other than schoolchildren, living in eight small towns. This corresponded with two complete electoral wards and a portion of a third. The remainder of this ward was not included, as its centre, socially and economically, lies outside the Rhondda Fach. The actual geographical boundary lies just within the southern end of the valley.

The nominal definition could have been carried out by a private census. This, however, would have demanded extra expense and man-power, and was thought to be undesirable for two reasons: (i) the discovery of exact prevalence figures was only a secondary objective and would in any case have been impossible if the lapse rate had been high; (ii) the National Census of 1951 was imminent, and we feared that if the two censuses coincided one or the other might be prejudiced. The nominal definition of the population was therefore carried out in the following way. For each town lists were prepared of those, other than schoolchildren, who were believed to be living in each street. These were made up from the most recent electoral rolls and from the lists of school-leavers for the last seven years. These combined lists were distributed to members of the local committees, who were asked to check the accuracy of the lists while distributing propaganda leaflets.

These lists were further checked by home-visiting by members of the team during the survey to encourage people to be *x*-rayed and by the home-visiting after the survey during the final check between the *x*-ray cards and those crossed off the lists. It is probable that a few errors remain, but they are unlikely to be important (see Appendix).

Our final "defined" population is not one that existed at any particular moment. The survey was spread over several months, and for each town a different date (the last day of *x*-raying in that town) was taken as critical. The population defined in this way, grouped by age and sex, is shown in Fig. 3.

Many individuals outside the defined population were *x*-rayed during the survey. We were particularly anxious to *x*-ray those who worked but did not live in the area. It proved impossible to define this group accurately, but the vast majority were certainly miners, for there are few other openings for work in the valley, and we know that not many of them refused to be *x*-rayed, as we were able to check the names of the miners *x*-rayed against nominal lists supplied by the National Coal Board for each colliery. Large numbers of people both working and living outside the area, particularly at the southern end of the valley, were also *x*-rayed.

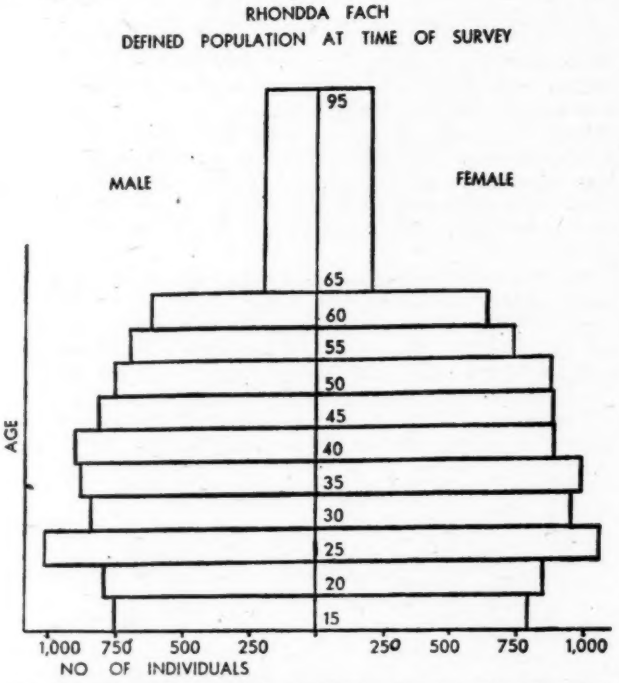

FIG. 3.—The defined adult population in the Rhondda Fach analysed by age and sex. The width of each column is proportional to the number of individuals in each age group.

The Population X-rayed

The population *x*-rayed (Table I) consists of those members of the population defined as having left school, of whom a technically acceptable radiograph had been obtained (1) by either of the teams, or (2) by anyone else within six months of the survey, provided that the film was either available to us or had been read by some recognized authority; this group consists mainly of tuberculosis cases in hospital, and, though small in number, is of great statistical importance. The remainder of the defined population will be called "lapses."

TABLE I.—*Percentage X-rayed of Defined Population at Time of Survey*

Sex	No. *X*-rayed	Lapses	Total Pop.	% *X*-rayed
Male	8,492	769	9,261	91·7
Female	8,605	1,352	9,957	86·4
Totals ..	17,097	2,121	19,218	89·0

The percentage *x*-rayed in the whole valley, though satisfactory, is lower than that recorded by several other authors. For instance, Schrag (1942), in a survey of Stuttgart, claimed to have *x*-rayed 98.4% of the adult population; Landquirt (Lönnerblad, 1950), in Gottland, 99.0%; Davies (Davies and Scherer, 1939), in Ely, St. Louis, 97.8%; Hedvall (1951), at Upsala, 97%; and Sigurdsson (1950), in Reykjavik, 98.1%.

In estimating the percentage *x*-rayed, errors can occur both in defining the population and in identifying the "*x*-rayed population" as part of this "defined" population. If, for instance, we had assumed that all adults we *x*-rayed belonged to the "defined population" we would have claimed to *x*-ray about 97% of it, whereas in fact we had *x*-rayed only 89%. No details about Landquirt's survey are available to check the percentage *x*-rayed. Schrag apparently used census data of 1939 for a survey in 1941, and the two-year interval, combined with the effects of mobilization, must have introduced considerable error. Hedvall apparently used census data, as did Sigurdsson, while Davies carried out a private census, which he found subject to some error. None of these authors mention any cross-checking of their defined and *x*-rayed populations, and none of them publish age–sex specific lapse rates, so it is difficult to judge the comparability of their figures with ours.

The only published surveys with which our results can be compared in detail are those carried out in Muscogee (Comstock, 1949) and in Aker (Borgen, Meyer, and Refsum, 1950), and it is striking that their claims of percentage *x*-rayed are more modest. A comparison of the percentage *x*-rayed in Aker, Muscogee, and the Rhondda Fach, analysed by age and sex, is shown in Fig. 4. The difficulty of *x*-raying the higher age groups is reflected in all the curves, but ours differ from the others in that the curve for men is higher throughout than that for women, and in that there is no great dip in the curve at the 20–24 age group; such a dip did, however, appear in the curve for women in two of the towns where we were least successful.

Table II shows the percentage *x*-rayed at the various Rhondda Fach towns. Some of the differences are easily explained: the towns D, E, and F were surveyed in particularly bad weather, and the lower percentage *x*-rayed was

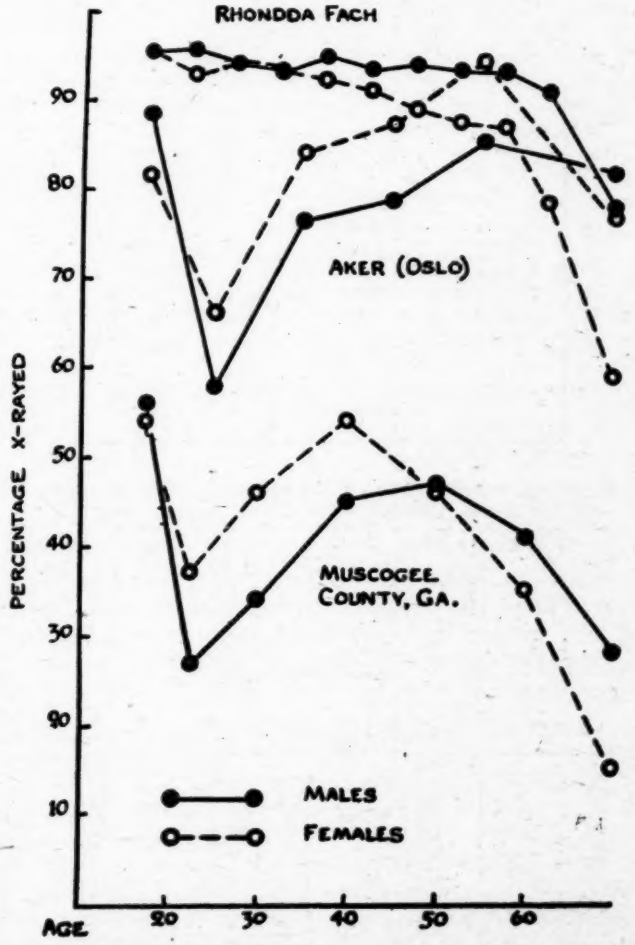

FIG. 4.—Comparison between the percentages *x*-rayed in the Rhondda Fach and two other community surveys.

TABLE II.—*Percentage of Defined Population X-rayed, Analysed by Town and Sex*

Town	Males				Females				Both Sexes			
	No. X-rayed	Lapses	Tot. Pop.	% X-rayed	No. X-rayed	Lapses	Tot. Pop.	% X-rayed	No. X-rayed	Lapses	Tot. Pop.	% X-rayed
A	1,305	86	1,391	93·8	1,327	162	1,489	89·1	2,632	248	2,880	91·4
B	2,133	148	2,281	93·5	2,147	362	2,509	85·6	4,280	510	4,790	89·4
C	529	83	612	86·4	517	138	655	78·9	1,046	221	1,267	82·6
D	1,541	185	1,726	89·3	1,528	304	1,832	83·4	3,069	489	3,558	86·3
E	381	59	440	86·6	388	53	441	88·0	769	112	881	87·3
F	588	84	672	87·5	639	110	749	85·3	1,227	194	1,421	86·3
G	698	34	732	95·4	705	75	780	90·4	1,403	109	1,512	92·8
H	1,317	90	1,407	93·6	1,354	148	1,502	90·1	2,671	238	2,909	91·8
Whole valley	8,492	769	9,261	91·7	8,605	1,352	9,957	86·4	17,097	2,121	19,218	89·0

chiefly due to a higher lapse rate in the elderly, who are most easily deterred by the weather. Town C remains to some extent a problem, since it was surveyed in reasonably good weather, but relatively little home-visiting was done there.

To investigate the reasons for refusal to be *x*-rayed, the percentage *x*-rayed amongst the men at two of the towns (A and G) was calculated separately for miners, ex-miners, and non-miners, and compared with the percentage for women. The results are shown in Fig. 5. It is clear that what at first appears to be a sex difference is really an occupational one, as there is very little difference between the non-miners and the women except in the highest age group, where the difference is probably explained by the higher average age of the women. The high percentage *x*-rayed amongst men was apparently due to the very high percentage of working miners *x*-rayed. This is confirmed by the percentage *x*-rayed in the four collieries in the valley, which were 99.6, 99.8, 98.4, and 99.4%.

We believe that the chief reason for our success in examining such a high proportion of the population was that we were working in an area profoundly affected by pneumoconiosis, whose worst effects the scheme was designed to mitigate. We had the enthusiastic support of the N.U.M., to which the majority of the male population belonged, and we persisted in visiting the lapses in their homes until we were faced with firm and immovable refusal to be *x*-rayed.

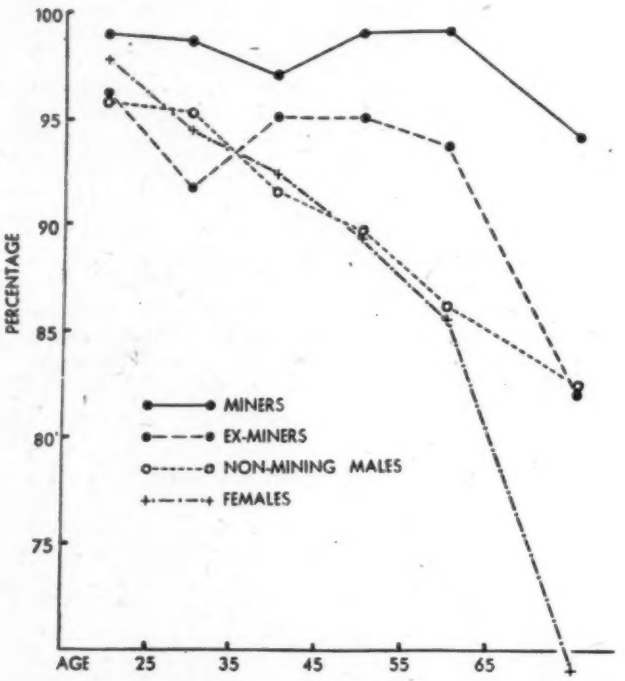

FIG. 5.—Comparison between the percentage of males *x*-rayed in each age group, analysed separately for miners, ex-miners, and non-miners, and the percentage of females *x*-rayed in two towns in the Rhondda Fach. Note the different ordinate scale from that used in Fig. 4.

Prevalence of Tuberculosis

Before considering the actual prevalence figures one point must be stressed. *All the rates quoted refer to the x-rayed population.* The prevalence of radiological abnormality among those who refused to be *x*-rayed is unknown, but is probably higher than among those *x*-rayed. We shall refer

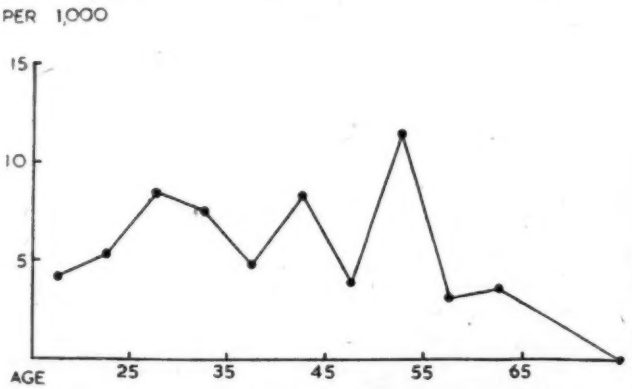

FIG. 6.—Prevalence of infectious pulmonary tuberculosis in Rhondda Fach males.

TABLE III.—*Prevalence of Infectious Cases of Tuberculosis among the Male Population of the Rhondda Fach*

Age	Miners and Ex-miners			Non-miners			Males Exposed to Other Dusts	All Males		
	No. X-rayed	No. Infectious Cases	No. per 1,000	No. X-rayed	No. Infectious Cases	No. per 1,000	No. X-rayed	No. X-rayed	No. Infectious Cases	No. per 1,000
15–	281	1	3·6	430	2	4·7	10	721	3	4·2
20–	303	2	6·6	454	2	4·4	3	760	4	5·3
25–	552	5	9·1	404	3	7·4	2	958	8	8·4
30–	515	3	5·8	286	3	10·5	3	804	6	7·5
35–	599	2	3·3	226	2	8·8	3	828	4	4·8
40–	640	5	7·8	198	2	6·1	2	840	7	8·3
45–	628	3	4·8	131	—		1	760	3	3·9
50–	606	8	13·2	94	—		—	700	8	11·4
55–	569	2	3·5	77	—	4·4	1	647	2	3·1
60–	499	1	2·0	57	1		2	558	2	3·6
65+	834	—	—	82	—	—	—	916	—	—
Total	6,026	32	5·3	2,439	15	6·2	27	8,492	47	5·5

to cases previously known to the health authorities before the survey as "old cases" and those who were discovered for the first time in the course of the survey as "new cases."

1. Infectious Cases

Cases were termed infectious if tubercle bacilli were found in their sputum either by direct smear or by culture, between May, 1950, and October, 1951, and if they were alive at the time the survey ended in the town where they were normally resident. To measure the degree of infectivity each case should, ideally, have gone through a strict routine of sputum investigations — so many smears, so many concentrates, so many laryngeal swabs. This was impossible in the field. Instead, we took at least two laryngeal swabs from all suspected cases—a procedure which proved simple to organize and demanded little co-operation from the patient.

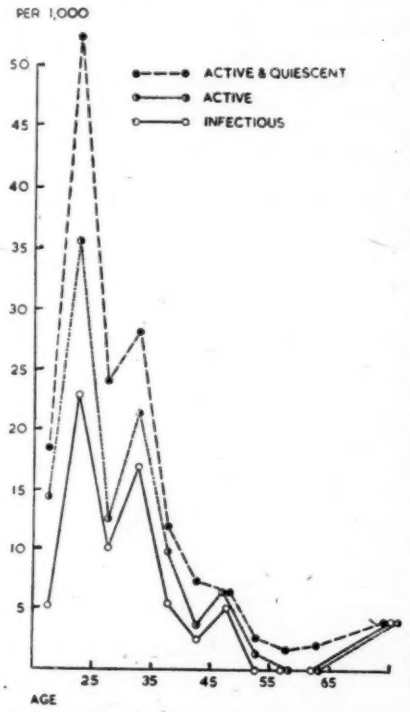

FIG. 7.—Prevalence of pulmonary tuberculosis in Rhondda Fach females.

The prevalence of infectious cases among males is shown in Fig. 6 and Table III, and the prevalence among females is shown in Fig. 7 and Table IV, together with the prevalence of "active" and "quiescent" cases. The shape of the curve for females is similar to that of the age-specific tuberculosis mortality curve (Fig. 1) and to Springett's attack rate curve (Springett, 1951). The male curve can be divided into that for miners and ex-miners on the one hand, and for non-miners on the other (Fig. 8 and Table III). The differences are not statistically significant, but the peak in the rates for miners and ex-miners over the age of 45 is possibly associated with the prevalence of P.M.F. in those age groups. The prevalence of positive sputa among cases of P.M.F. is shown in Table V. In the first two towns all cases of P.M.F. were swabbed, but, when the results came through and such a relatively low prevalence of positive sputa was found, it was decided to swab only those cases in which there was a history of a recent loss in weight or whose radiographs showed cavitation. The prevalence of positive sputa found in the later towns was similar to that in the first two towns.

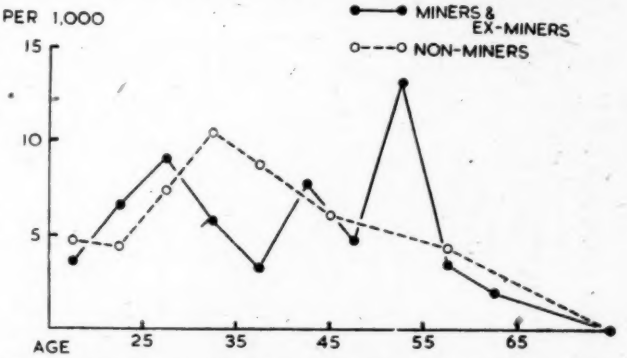

FIG. 8.—Prevalence of infectious pulmonary tuberculosis analysed by occupation. The numbers of non-miners in the older age groups are small and these have been combined to give a smoother curve.

Approximate case-fatality rates for the two sexes (Table VI) can be deduced by dividing the prevalence rate by the mortality rate in each age group. This method will exaggerate the case fatality in the older age groups, for a number of the younger patients will move into the older group before death. Tattersall (1947), Thompson (1943), Berg (1939), Lindhardt (1939), and Backer (1937) all found that approximately 70% of patients with a positive sputum died within five years, but the vast majority of their cases were all positive on smear, while ours included also those positive only on culture. These authors found relatively little difference in time of survival between males and females, but our figures suggest quite a considerable difference in the

TABLE IV.—*Prevalence of Pulmonary Tuberculosis among the Female Population of the Rhondda Fach*

Age	Pop. X-rayed	No. Infectious Cases	No. per 1,000	No. Active Cases (including Infectious)	No. per 1,000	No. Active and Quiescent Cases	No. per 1,000
15–	758	4	5·3	11	14·5	14	18·5
20– ..	787	18	22·9	28	35·6	41	52·1
25– ..	994	10	10·1	13	13·1	24	24·1
30– ..	889	15	16·9	19	21·4	25	28·1
35– ..	913	5	5·5	9	9·9	11	12·0
40– ..	810	2	2·5	3	3·7	6	7·4
45– ..	785	4	5·1	5	6·4	5	6·4
50– ..	770	—	—	1	1·3	2	2·6
55– ..	645	—	—	—	—	1	1·6
60– ..	503	—	—	—	—	1	2·0
65+	751	3	4·0	3	4·0	3	4·0
Total	8,605	61	7·1	92	10·7	133	15·5

These figures are derived by adding the prevalence in the individual towns, at the critical date for each town.

TABLE V.—*Prevalence of Infectious Tuberculosis among Cases of P.M.F. in the Rhondda Fach*

Age	No. of Cases of P.M.F.	No. Swabbed	No. Positive on Culture or Smear	% Positive of Total
15–24				
25–34	54	17	2	3·7
35–44	149	59	2	1·3
45–54	168	73	2	1·2
55–64	195	74	2	1·0
65+	170	80	—	—
Total..	736	303	8	1·1

TABLE VI.—*Case-fatality Ratios of Infectious Tuberculosis Cases in the Rhondda Fach*

	Males				Females			
Age:	15–24	25–44	45–64	All Ages	15–24	25–44	45–64	All Ages
Prevalence of infectious tuberculosis per 10,000 x-rayed	47·2	72·9	56·2	62·0	129·3	88·8	14·8	64·5
Death rate from tuberculosis per 10,000 ..	5·6	9·5	13·6	10·2	11·5	8·2	2·3	6·8
Case-fatality ratio (%) in 5 years ..	60·0	65·1	100·0	82·4	44·5	46·2	77·6	52·4

TABLE VII.—*Prevalence of Infectious Tuberculosis Cases among the Surface and Underground Workers in Four Rhondda Fach Collieries*

Colliery	Surface			Underground			Total		
	No.	No. Cases	No. per 1,000	No.	No. Cases	No. per 1,000	No.	No. Cases	No. per 1,000
P ..	109	0	—	157	0	—	266	0	—
Q ..	243	0	—	740	3	4·1	983	3	3·1
R ..	195	0	—	706	0	—	901	0	—
S ..	215	0	—	546	1	1·8	761	1	1·3
Total..	762	0	—	2,149	4	1·9	2,911	4	1·4

Rhondda Fach, probably due to the very poor prognosis of a positive sputum when combined with pneumoconiosis (Fletcher, unpublished data), a condition found in more than a quarter of our male infectious cases. Of the infectious female cases 31%, and of the males 28%, were "new." These proportions may be artificially high, as it is probable that some people who suspected they might have tuberculosis decided to wait for the coming survey rather than go to the clinic.

Table VII shows the prevalence of infectious cases in the four pits in the valley. The rate is low, and it is satisfactory to report that all four cases are now (August, 1952) sputum-negative and out of hospital.

TABLE VIII.—*Active Tuberculosis and Progressive Massive Fibrosis among Miners and Ex-miners in the Rhondda Fach*

Age	X-rayed Population	Active Pulmonary Tb.			P.M.F.	% Total Disease
		No. Primary Type Tb.	No. Reinfection Type Tb.	Total Active Tb.	No.	
15	281	3 (1·07%)	1 (0·36%)	4 (1·42%)	—	2·85
20	303	—	2 (0·66%)	2 (0·66%)	—	1·32
25	552	—	6 (1·09%)	6 (1·09%)	10 (1·81%)	3·99
30	515	—	3 (0·58%)	3 (0·58%)	42 (8·15%)	9·23
35	599	—	3 (0·50%)	3 (0·50%)	66 (11·01%)	12·02
40	640	—	8 (1·25%)	8 (1·25%)	84 (13·12%)	15·63
45	628	—	4 (0·64%)	4 (0·64%)	98 (15·60%)	16·88
50	606	—	9 (1·49%)	9 (1·49%)	75 (12·38%)	15·35
55	569	—	2 (0·35%)	2 (0·35%)	103 (18·10%)	18·80
60	499	—	2 (0·40%)	2 (0·40%)	106 (21·24%)	22·04
65+	834	—	2 (0·24%)	2 (0·24%)	192 (22·99%)	23·50
Total	6,026	3 (0·05%)	42 (0·70%)	45 (0·75%)	776 (12·88%)	14·37

2. Active Cases

This group includes all the cases of pulmonary tuberculosis which, after examination at the area chest clinic, were graded A or B, I, II, or III (Ministry of Health Classification: Memorandum 37/T Revised) at the time of the survey. It includes those cases of primary type tuberculosis and pleural effusion which were considered active, and sputum-negative as well as sputum-positive cases. Detailed discussion of the non-mining male population has been omitted owing to its abnormal age distribution and selected nature. The prevalence in females is given in Fig. 7. In the presence of dust disease it is so difficult to draw a dividing-line between active tuberculous disease and progressive massive fibrosis that the corresponding figures for miners and ex-miners have been shown separately in Table VIII, together with the figures for P.M.F.

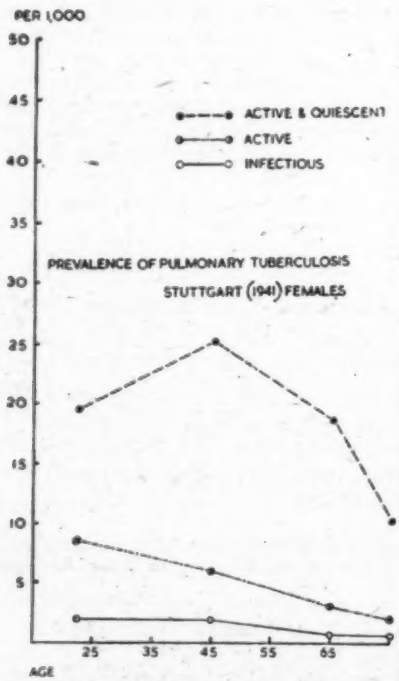

FIG. 9.—Prevalence rates of pulmonary tuberculosis among females in Stuttgart (1941), for comparison with Fig. 7. No similar comparison between the males in Stuttgart and the non-mining males in the Rhondda Fach is possible, because the latter is selected in nature and deficient in the higher age group.

Apart from the high prevalence of P.M.F., which is not relevant to this report, the most striking feature is the very high prevalence of active disease amongst the younger females.

3. Active and Quiescent Cases

Fig. 7 and Table IV give the prevalence of all active and quiescent cases among females. There is probably considerable difference of opinion regarding the diagnosis of quiescent disease, but it is disturbing to find that 1 in 20 of the young females required regular clinic supervision or other attention for pulmonary tuberculosis.

4. Comparison with Other Surveys

Though the literature on the results of radiographic surveys is extensive, only Schrag (1942) has added his previously diagnosed cases to those found during the survey, to give the total number of infectious cases in the community, and analysed them by age and sex. Fig. 9 shows the prevalence rates he found for infectious, active, and quiescent cases among females in Stuttgart. There are striking differences

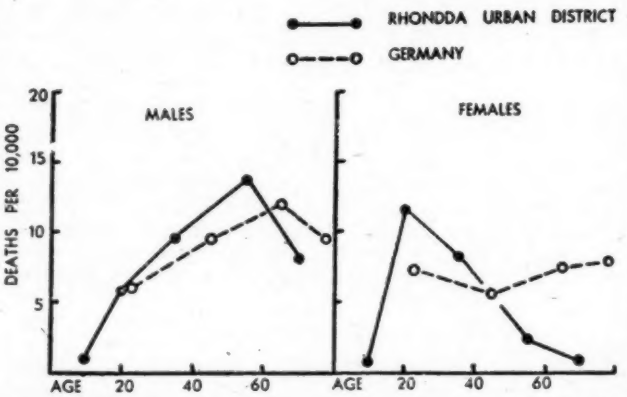

FIG. 10.—Tuberculosis mortality rates for Rhondda Urban District (1946–9) and Germany (1938).

beween the German and the Rhondda curves for infectious and active tuberculosis amongst the females (cf. Fig. 7). The age-and-sex specific tuberculosis death rates for Germany for 1938 (the figures quoted by Schrag) are compared in Fig. 10 with those of the Rhondda Urban District for the period 1946–9. There are marked differences in the female rates, so there is a possibility of a real epidemiological difference. On the other hand, it seems possible that Schrag, working under wartime conditions, did not investigate sputa on such a large scale as we did. This might account for the differences in infectious tuberculosis, and different radiological standards might account for the other differences. Possible errors in his definition of the population have already been referred to.

Sigurdsson gives figures for the prevalence of active (tuberculous) cases, both old and new, for the population of Reykjavik, but he does not divide them into males and females. His results are compared with ours in Fig. 11. Here the agreement is better than in the case of Schrag's figures, although in the younger age groups the prevalence of the disease seems definitely higher in the Rhondda Fach.

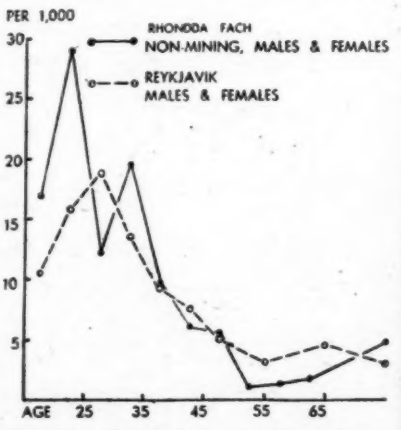

FIG. 11.—Comparison of active tuberculosis cases for males and females in the Rhondda Fach and Reykjavik.

A further comparison is possible with the figures for tuberculosis found by the "Sickness Survey" (Stocks, 1949), which gives a measure of how many people are ill with a particular disease on a particular day (the point sickness rate). Table IX compares this with the Rhondda Fach prevalence rates for active tuberculosis. One would have expected the results of the Sickness Survey to correspond roughly with our prevalence of "old" active cases, and it is surprising to find it considerably lower.

"New" cases, which represented 41% of all the male active cases and 39% of the female active cases, can be compared with the figures published by the Ministry of Health of the prevalence of new cases of active tuberculosis found by mass radiography between 1943 and 1948 (Ministry of Health Annual Report, 1950). It would have been more correct to make the comparison only with the results of all community surveys, but these figures are not separately available. Fig. 12 shows that there are considerable differences between our findings and theirs as regards the females. This confirms the observation of Bradbury (1948) that the percentage of tuberculosis found in a survey is proportional to the percentage response obtained, and also those of Cochrane (1950) on the relationship between prevalence of tuberculosis and the "order of coming up" to be x-rayed. Fig. 12 suggests that this tendency of active cases to come forward late is confined to the younger age groups amongst the females. No comparison has been made between the males, as the non-mining male population in the Rhondda Fach is abnormal.

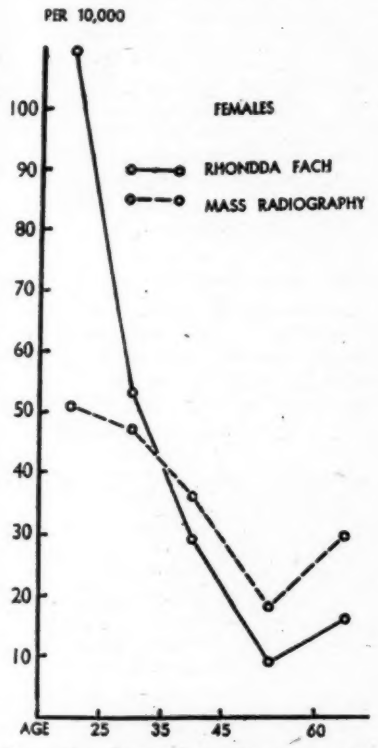

FIG. 12.—Comparison between newly discovered active tuberculosis cases in the Rhondda Fach and those discovered by mass radiography (1943–8).

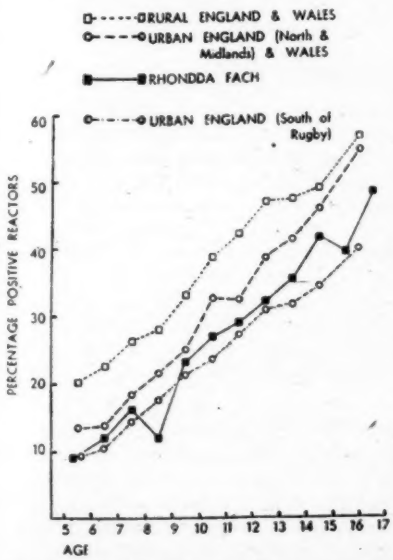

FIG. 13.—Results of tuberculin testing in the Rhondda Fach compared with those of the M.R.C. surveys in England and Wales (Jarman, 1952).

In general, the evidence suggests that our figures for prevalence of tuberculosis in the Rhondda Fach are higher than those found in other areas, and the somewhat higher tuberculosis death rates found in the Rhondda in comparison with those for England and Wales suggest that the Rhondda Fach is somewhat atypical in this respect. On the other hand, the figures for the prevalence of positive tuberculin reactions among schoolchildren, illustrated in Fig. 13, suggest (Jarman, 1952) that in this respect it is very close to the average of England and Wales. It is therefore possible that similar prevalences would be found in other areas in England and Wales if detailed studies were made.

TABLE IX.—*Comparison Between the Prevalence of Infectious and Active Tuberculosis per 1,000 in the Rhondda Fach and the Results of Sickness Survey, 1946–50*

		Non-mining Males	Females
Rhondda Fach "old"	Infectious	5·3	4·5
	Active	9·0	6·5
Rhondda Fach "old" and "new"	Infectious	6·1	7·1
	Active	13·5	10·7
		Males and Females	
Sickness survey, 1946–50	Number of persons ill with pul. Tb. on an average day	2·77	

Prevalence of Pneumoconiosis

The population considered to be "at risk" for the study of the prevalence of pneumoconiosis consists of the miners and ex-miners living in the valley defined as those who were employed at the time of the survey either on the surface or underground at a colliery, or who had been so employed in the past for at least three months.

The radiological classification used was that of the Pneumoconiosis Research Unit (Fletcher *et al.*, 1949), except that Categories 3 and 4 have been combined. It is thus similar to the international classification proposed by the I.L.O. Conference of Experts on Pneumoconiosis at Sydney

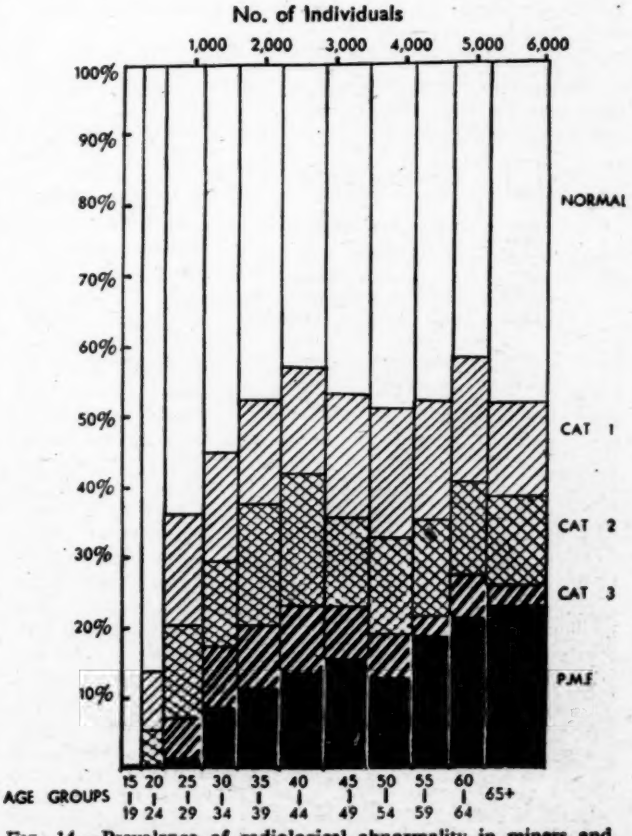

FIG. 14.—Prevalence of radiological abnormality in miners and ex-miners in the Rhondda Fach. In this histogram the area of each column is proportional to the number of individuals in that age group.

in 1950 (Cochrane, Davies, and Fletcher, 1951). Those unacquainted with the terminology and natural history of coal-workers' pneumoconiosis are referred to recent publications of the Pneumoconiosis Research Unit (Davies *et al.*, 1949; Fletcher *et al.*, 1949; Cochrane, Fletcher, Gilson, and Hugh-Jones, 1951). It must be remembered that this classification is not concerned with disability, and it is doubtful whether the earliest stage (Category 1) ought to be regarded as a disease at all. It is true that Gilson and Hugh-Jones (1953) and Hanaut (1952) concluded that, when due allowance is made for age, disability is to some extent correlated with *x*-ray category, but in neither of the investigations was Category 1 considered separately. This category is not recognized for purposes of "diagnosis" under the National Insurance (Industrial Injuries) Act (1946), while in France and Belgium similar films are not legally recognized as indicating pneumoconiosis or silicosis. Pending further investigation it is better to consider Category 1 simply as slight evidence of dust exposure.

Fig. 14 shows the prevalence of pneumoconiosis among miners and ex-miners in the Rhondda Fach. Even if Category 1 cases are ignored the prevalence of pneumoconiosis is definitely high. It must be remembered, however, that the prevalence is probably higher than that (Fig. 2) of South Wales as a whole, and thus higher than in any other part of the country. It is also reassuring to find that a considerable number of cases of massive fibrosis occur beyond the age of 65: pneumoconiosis may be a disabling rather than a killing disease.

Other Workers Exposed to Dust

There was a small group of men in the valley who had been exposed to dust other than coal dust. It consisted chiefly of stonemasons, amongst whom two cases of pneumoconiosis were diagnosed. One man whose life had been spent as a dustman and who had never worked in a coal mine was diagnosed as suffering from a simple pneumoconiosis, Category 2; the appearances were atypical and he had no symptoms, so the correct diagnosis remains in doubt.

Tuberculous Infection in the Valley

Tuberculous infection can, it is generally believed, be best measured by tuberculin-testing. This aspect of the work will be discussed by one of us in greater detail in a separate report (Jarman, 1952). Here we are concerned only with the sources of infection—that is, the infectious cases. These can be roughly classified in the following way: (1) previously unknown ("new") cases—who do not know they are infectious; (2) previously known ("old") cases who have never been in hospital but who know they are infectious; (3) previously known cases who have been in hospital; (4) previously known cases in hospital at the time in question. Using this classification, the positions at the beginning and the end of the survey are shown in Fig. 15. The figures for the beginning of the survey are maximal, for it is possible that as the survey extended over a period of six months some of the old cases had died before some of the new ones existed. The figure does suggest, however, that there was probably a marked reduction in the tuberculosis infectivity of the valley after the survey.

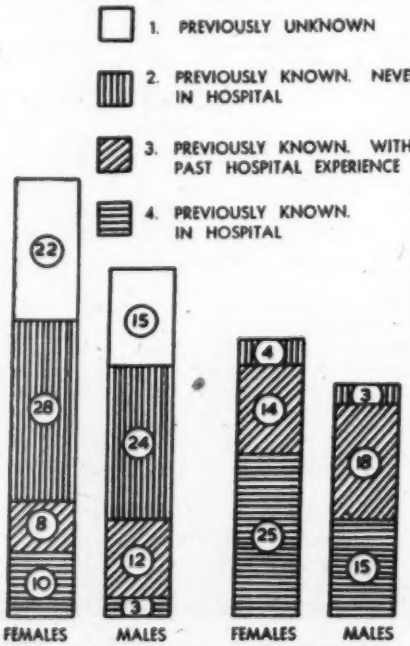

FIG. 15.—The numbers of infectious pulmonary tuberculosis cases in the Rhondda Fach immediately before and at the end of the survey.

Following our survey, the Regional Hospital Board made special provision for hospital treatment of tuberculous cases from the Rhondda Fach. Two 27-bed wards in Tyntyla Isolation Hospital were made available for cases of pulmonary tuberculosis. Special consideration was given to the Rhondda Fach, but cases were admitted from neighbouring districts as beds became available. All but two of the infectious cases from the Rhondda Fach agreed to go to hospital. The results of treatment are referred to below. It was unfortunately impossible to keep all cases in hospital until they ceased to be infectious, so that some still had a positive sputum when they returned home. The number of infectious cases in the valley has been reduced by about 60%. These infectious cases are all frequently visited by the health visitor, who continues to supervise them and instruct them in sputum control, and as a result we believe that their infectivity has been greatly reduced.

Results from Tyntyla Hospital

The great majority of cases were treated conservatively with rest in bed and a course of streptomycin and P.A.S. Collapse treatment was carried out where indicated. Facilities for thoracic surgery were not available, but the few cases which required it were transferred to Sully Hospital or elsewhere for this purpose. Table X summarizes the results obtained with the sputum-positive cases after an average period of observation of one year. The lower sputum conversion and higher mortality rates amongst the males is probably associated with the difficulty of treating a case of pneumoconiosis with positive sputum. Our figures are based on unselected cases from the complete population, and are therefore not comparable with other published figures which are based on selected hospital groups.

TABLE X.—*Mortality and Conversion Rates of Infectious Tuberculosis Cases in the Rhondda Fach. (The Average Time of Observation was Approximately One Year)*

	No.	Died	Converted
Male	54	9 (16·7%)	13 (24·1%)
Female	68	9 (13·2%)	30 (44·1%)
Total ..	122	18 (14·8%)	43 (35·2%)

Effects on the Valley

Our results suggest that we have been reasonably successful in discovering infectious cases in the valley and getting them into hospital. We have therefore every reason to hope that we have caused a marked reduction in the tuberculous infectivity. To what extent this will have reduced the tuberculin conversion rates and the rate of appearance of new cases will become apparent when the follow-up survey takes place in 1953. The same is true as regards the rate of appearance of P.M.F., but it can at least be safely said that one possible effect, often prophesied, did not appear—there was none of the alarm which has sometimes been regarded as an inevitable result of widespread radiography.

Discussion

This work demonstrated that it is possible to *x*-ray 90% of the adult population of a community. When the follow-up survey has been completed it should be possible to judge whether mass radiography, combined with treatment, has a definite prophylactic effect. It seems to us important that the value of such a new technique should be measured accurately before it is either put into general use or discarded. It is improbable that we shall achieve the same

striking effect as Davies (Davies and Scherer, 1939; Davies, 1946) found in the United States, for a number of the men who had progressive massive fibrosis will continue to develop a positive sputum despite any reduction in exogenous infection. We would therefore urge other regional boards to carry out similar studies in their areas.

Lönnerblad (1950) denies that community surveys can have any prophylactic value, since he maintained that death rates from tuberculosis on the island of Gottland showed no improvement relative to the whole of Sweden after a 99% survey in 1943. The actual figures on which his arguments are based are shown in Table XI, and it is clear they

TABLE XI.—*Tuberculosis Death Rates per 100,000. After Lönnerblad (1950)*

Year	Gottland	Sweden
1942	96	68
1943	98	68
1944	64	65
1945	81	59
1946	54	51
1947	49	48
1948	70	48

give no basis for despair about the effect of mass radiography. The death rate, then, on the island in 1947 was 50% of what it had been in 1943, whilst in the whole of Sweden it was still 70% of what it had been in 1943. The higher figure in 1948 for Gottland may be a random fluctuation as the number of deaths became smaller. Lönnerblad may be correct, but he does not seem to have proved his case.

From the theoretical point of view we believe that we have made the most accurate measurement yet achieved of the amount of tuberculosis in a community. This is of scientific value in itself as well as providing a basis for future scientific studies. It is also of value sociologically in measuring the damage done to a community by tuberculosis and in estimating the total load a clinic may have to bear.

The lack of suitable material with which to compare our results is unfortunate. There have been many excellent publications in recent years, describing *x*-ray surveys in various countries, but none of them, with two exceptions, adds the "old" cases to the "new" cases, and in one of the exceptions the "old" and "new" cases are not analysed by sex, so it is impossible to get an accurate picture of the prevalence of disease in the community. Further difficulties militating against accurate comparison are: (1) the different radiological terminologies in use throughout the world, and (2) the lack of information in the published accounts on whether tubercle bacilli have been found in the sputa of the cases classified as active.

Hopes of an international radiological classification of tuberculosis which would not only be generally accepted but be actually applied in a similar way are probably illusory, but it should surely be possible to arrange that the results of all community surveys undertaken in this country are comparable.

The most important points, in addition to the standardization of the reading of *x*-ray films, appear to us to be: (1) That the population at risk should be individually defined; (2) that prevalence rates should be based on diagnoses made at a clinic or hospital and include "old" and "new" cases; (3) that sputum results should be regarded as as important as radiological readings; (4) that results should be given for each sex separately in the standard age groups.

The high prevalence rates for both tuberculosis and pneumoconiosis found in this survey seem to be important. Those for pneumoconiosis are probably atypical, but it seems possible, if the results for tuberculin-testing are any guide, that many other areas will have similar prevalence rates for tuberculosis. Tuberculosis death rates fall so spectacularly and new drugs are heralded so regularly in the daily press that it is opportune to point out that a falling death rate can be associated with a rising prevalence rate, that no drug can be really effective in tuberculosis unless we know all the cases that are in need of it, and that in the Rhondda Fach, as no doubt in other places, tuberculosis is still a serious medical and social problem.

Summary

A field experiment was designed to study, in a mining community with a high prevalence of pneumoconiosis, the effect of reducing tuberculous infectivity upon the rate of appearance of progressive massive fibrosis (P.M.F.) in miners already affected by simple pneumoconiosis.

The community chosen was that of the Rhondda Fach (Little Rhondda Valley). The method was to discover as many cases of open tuberculosis as possible by an *x*-ray survey, to make special hospital provision for these cases, and to instruct in sputum control those who retained a positive sputum despite treatment.

The present report is concerned with the findings of the first radiological survey of the adult population in respect of tuberculosis. The population was defined by electoral rolls and lists of school leavers during the past seven years, and was fully checked by home-visiting during and after the survey. Of the male population 91.7% and of the female population 86% were *x*-rayed. The lapses were greatest among the non-miners and the elderly.

Cases of tuberculosis were classified as infectious, active, and quiescent. In miners with pneumoconiosis, massive fibrosis and active tuberculosis were considered to be radiologically indistinguishable and were classified together.

Figures are given for the prevalence of tuberculosis by age and sex. In females the overall prevalence of infectious tuberculosis was 7.1 per 1,000 and in males 6.2 per 1,000. In females aged 20–24 the prevalence was 22.9 per 1,000 for infectious tuberculosis and 35.6 per 1,000 for active tuberculosis. The sputum of 1.1% of all cases of massive fibrosis was positive. The prevalence of positive tuberculin reactions among the schoolchildren was similar to that found in other urban areas in England and Wales, which suggests that the prevalence of tuberculosis in this valley may be typical of other such areas in the country.

About 30% of the miners and ex-miners had some radiological signs of pneumoconiosis (Category 2 or more); 15% had progressive massive fibrosis.

All but two cases of infectious tuberculosis were given hospital treatment. The number of infectious cases living in the valley has been reduced by about 60%, and they are all being closely supervised by a health visitor.

Future surveys will show what effect this reduction will have on the tuberculin positivity and the rate of appearance of new cases of tuberculosis and of massive fibrosis.

APPENDIX

A. Errors in Determining Populations

The Total Population.—We started with electoral rolls and lists of school leavers. We thought this material was subject to the following errors: (1) those inherent in all electoral rolls—we believed these to be small; (2) those due to assuming that the people who had left school were still living at the same address as at the time of leaving; (3) those due to assuming that no one between the ages of 14 and 21 had entered the town in the last seven years. It was hoped that most of these errors would be eliminated by the visits of the members of the local committees,

but it was soon evident that there was a residual error after their visits. The second round of home-visiting, which was chiefly directed towards persuading people to be *x*-rayed, reduced this error still further. For instance, everybody whose name was on the electoral roll and whose name had not been crossed off as *x*-rayed was visited. This, however, could not deal with the problem of people whose names were not on the electoral roll because they had moved recently into the area, whose names had not been added by the visitor from the local committee, and who had not come on their own accord to be *x*-rayed. We attempted to get round this difficulty by asking at every house we visited whether there was anybody there who had not yet been *x*-rayed. This certainly reduced the error a little further, but we cannot claim that every house was visited. The final round of home-visits, to clear up the discrepancies between those crossed off on the street lists and the *x*-ray cards available, also assisted in reducing both types of error. We must, however, concede that there is a possibility that some people entered the area after the electoral rolls had been made up and about whom we never received any information.

The Population X-rayed.—Cards were made out for all persons *x*-rayed and were used as a card index of the *x*-rayed population. Errors could arise in the following ways: (1) A person could have been *x*-rayed more than once. It happened on several occasions that a person was *x*-rayed twice, and on one occasion three times. (2) A person not living in the defined area who was *x*-rayed during the scheme could have been included in the "population *x*-rayed." (3) A person could have been included who had been *x*-rayed but whose radiograph was technically unreadable. We believe that the careful check at the end of the survey, when the *x*-ray cards available for each street were verified individually against the street lists, reduced these errors to negligible proportions.

It is of interest that when at the end of the survey the cards of all those *x*-rayed were checked off against the street lists considerable discrepancies were found. These discrepancies were very carefully analysed, and were found to be chiefly due to the wrong person being crossed off the street lists at the time he had been *x*-rayed, or, alternatively, by a new name being added and crossed off. This in both cases led to duplication and finally resulted in there being a larger number crossed off the street boards than the number *x*-rayed. It required much home-visiting to make the street lists balance with the *x*-ray cards.

B. Radiological Technique

1. *M.M.R.*—The topography of the valley made it almost impossible to use a heavy mobile unit, so a transportable unit was employed. The normal mass-radiography record card as designed and supplied by the Ministry of Health was used. Initial examinations were carried out by the usual 35-mm. technique, using a Watson set incorporating an automatic photo-electric exposure timer. Examinees were *x*-rayed without stripping to the waist, only heavy outer garments being removed. Large films—15 in. by 12 in. (38 cm. by 30 cm.)—were used for all recall examinations, and at the first examination of disabled people or others unlikely to return for another film if it was necessary.

2. *P.R.U.*—Each miner or ex-miner was supplied with a card on which was written his name, address, and date of birth. At one end of this was a lead strip having a perforated serial number punched in it. The apparatus used was the Victor KXS 4-valve with rotating anode tube (2-mm. focal spot), and the following points of technical detail were standardized: focal film distance, 60 in. (152 cm.); milliamperage, 400; kilovoltage, 52–68 (dependent on the A.P. diameter of the chest); time, 0.08 second or less; screens, high definition; films, standard speed; development, 5 minutes at 66° F. (18.9° C.).

Originally the electricity was taken from the mains supply, but fluctuations in the load made this erratic and unreliable, so the *x*-ray van was later supplied by its own generator.

C. Procedure, Personnel, Method of Work

1. *M.M.R.*—The staff consisted of a medical director, a superintendent radiographer, two assistant radiographers, one senior clerk, and two junior clerks. All miniature films were read independently by the medical director and a doctor from the P.R.U. team. Large films were taken if requested by either reader. The disposal of the cases was determined by the medical director alone. The films were classified according to the standard Ministry of Health Code. In addition, the category "Observation" was used for cases in which it was impossible to tell from one film the exact diagnosis of a pulmonary shadow, and the category "MR Obs" was used for some of the cases which would normally have been designated "healed post-primary P.T.s." These cases had a more detailed examination, including sputum culture, than would have been given during a routine survey. The disposal of the cases followed the usual M.M.R. procedure. An interview was offered to all cases showing what might be significant radiological abnormalities, whether these represented pulmonary tuberculosis or other chest conditions. Those suspected of suffering from non-tuberculous conditions were referred to their general practitioners. Several persons who failed to attend for their interview with the medical director were visited at home. All those suspected of suffering from tuberculosis were referred, after informing their doctors, to the local chest clinic. Investigation followed the usual lines. Rather broader indications than usual were used when advising treatment in hospital.

2. *P.R.U.*—The staff consisted basically of two doctors, two radiographers, two dark-room assistants, one male nurse, one industrial-history taker, two secretaries, and one driver. The industrial histories were taken by the doctors, male nurse, and the industrial-history taker; all miners and ex-miners who so wished were interviewed by one or other of the doctors after the survey. Laryngeal swabs were taken, where indicated, at the time of interview by the doctor or the male nurse. All films were inspected for technique as soon as they were dry, and retakes were asked for when the films were not technically perfect. The retake rate amounted to 20%. All the films were read by the two P.R.U. readers (Dr. I. Davies and A. L. C.), usually at the pit-head *x*-ray station.

D. Statistical

Although this section involves a certain amount of repetition, it seems worth while summarizing the source of the various figures given in this paper, and the techniques used to produce them.

The "Defined" and X-rayed Populations

These were derived from the "corrected" street lists. In the final check the cards of everyone who had been *x*-rayed, together with the nominal list of those who were known to have refused, were checked individually against each street list. Nominal discrepancies were then checked by home-visiting, until none remained. Anyone claiming to have been *x*-rayed for whom no card could be found was added to the nominal list of lapses. The cards for men and women for each street were then counted separately. In the case of women and non-miners the standard M.M.R. cards were used, and each group was counted by hand independently by two observers, with recounts if they disagreed. In the case of miners and ex-miners, details of their industrial histories and radiological findings had already been put on "Findex" cards, and they were counted by an automatic counter (Wright, 1952), which saved a very considerable amount of time. The number of lapses was similarly totalled for each street and for each sex, and the sum of the four counts checked against an independent count of each street list.

As each town was completed the cards of women and non-miners for all streets were divided by hand into 5-year age groups for each sex, and each age group was counted by two observers. In the case of miners and ex-miners this was done by Findex technique. The lapse rates were "broken down" by age and sex in a similar way and the totals for both sexes checked against the totals from all the streets.

The numbers of tuberculous cases in the various age–sex groups were derived from a "master list" which was compiled for each sex in each town. This was based originally on a list of all notified cases in the area, which was first cross-checked against the local clinic register and then kept up to date. All names on it were checked against the card index of those who had been *x*-rayed, and at the end of the survey it was checked against lists of all tuberculous cases found by either team. The sputum status of infectious cases was checked by comparing them with the names of all those found to be positive by the laboratory serving that area.

The actual status of the patients—active, quiescent, or inactive—was taken from the clinical assessments made by the doctors at the clinic. The figures for the prevalence of dust disease were based on radiological diagnosis alone. These were "punched" on to Findex cards and the prevalence of disease by age was obtained by means of the Findex analyser and the automatic counter.

Acknowledgments.—In a scheme such as this, which depended for its success on the co-operation of many thousands of people, it is necessarily invidious to mention only a few of them, but we should nevertheless like to record our gratitude to Dr. Norman Tattersall, Dr. Trevor Jones, and Dr. Alwyn Smith, of the Welsh Regional Hospital Board; to Professor Heaf, of the Welsh National School of Medicine; to Mr. John H. Phillips, Admini-

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Note.—Some figures have been presented without accompanying tables in order to save space. Anyone wishing to have the actual figures should apply to Dr. A. L. Cochrane, the Pneumoconiosis Research Unit, Llandough Hospital, Cardiff.

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A working party of the United Nations Economic Commission for Europe has been studying the prevention of road accidents by action on an international scale. It recommends the formation of an international traffic association to help in the exchange of information. Useful work already done includes arrangements for publication of comparable international statistics on road accidents—the first series, for the year 1953, will be published early in 1954. An international road safety manual is being prepared: the aim is that it should provide a model for national highway codes. The working party also studied safety requirements for road vehicles, with particular regard to brakes, headlights, rear lights, and traffic indicators. A meeting of experts to report on physical, mental, and psychological requirements for drivers was recommended. On the other hand, while admitting the important part played by engineers specializing in traffic problems and the need for a European centre for their training, the working party thought that the time was not yet ripe for the creation of such an institute. The alternative was the international road traffic association, which would bring together road engineers, traffic engineers, police, and other competent authorities.

INCIDENCE OF THE PHYSIOLOGICAL THIRD HEART SOUND

BY

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The beating human heart produces many vibrations of very varying amplitude and frequency. Two series of vibrations are of such amplitude and frequency that they are audible on auscultation of all normal subjects; these are the first and second heart sounds. But we have no right to suppose that these are the only vibrations of constant occurrence during the cardiac cycle.

At the beginning of this century a third heart sound was described by Gibson (1907) and Hirschfelder (1907). This sound was heard in only a proportion of subjects. There is now general agreement that the physiological third heart sound is more commonly audible in young people, but a great diversity of opinion still exists regarding the normal incidence of this sound in various age groups. Table I gives some representative findings of the incidence of the third heart sound in healthy subjects on auscultation.

TABLE I.—*Incidence of the Third Heart Sound in Subjects Without Heart Disease: Auscultation*

Date	Author	No. of Subjects	Age Group (Years)	Incidence of 3rd Sound (%)	Subjects
1909	Thayer	90 55	10–20 20–30	84·4 50·9	Boys, girls, hospital patients, and prisoners
1915–17	Bridgman	16	12–15	81·3	Boys
1926	Steinberg	100	4–14	48·0 95·0*	Children
1926	Gubergritz	600	N	93·7	N
1940	Mannheimer	135	0–14	0·7	Boys and girls
1946	Carlgren	150	3–17	12·0	,, ,,
1947	O'Meara	745 255	17–20 21–30	53·6 34·9	Men naval recruits and personnel
1951	Present investigation	123	17–32	9·8	Men and women students

N=not mentioned.
* Direct auscultation without stethoscope.

Einthoven (1907) was the first to note the appearance of vibrations on phonocardiograms at the time of the third heart sound, and these vibrations have since been studied by many workers, using various types of phonocardiograph. Table II gives the incidence of the third heart sound as recorded by some of these investigators.

There is obviously wide difference of opinion regarding the actual incidence of the third heart sound, but most authorities agree that it is detectable on auscultation or by phonocardiography in only a proportion of normal subjects. There are two possible explanations of this. The "sound" may be due to vibrations which are present in only a proportion of subjects: the third heart sound would then be due to a phenomenon of cardiac activity peculiar to certain individuals. Alternatively, the vibrations may be present in the early stages of diastole in all subjects but in many cases are of such amplitude and frequency that they cannot be detected. On this latter interpretation detection of a

third sound may depend largely on extraneous circumstances such as the experience of the observer, the level of background noise in the environment, and indeed on a whole host of factors having nothing to do with the activity of the heart at all. The discrepancies between the findings of different observers rather favour the second alternative.

TABLE II.—*Incidence of the Third Heart Sound in Subjects Without Heart Disease: Phonocardiography*

Date	Author	No. of Subjects	Age Group (Years)	Incidence of 3rd Sound (%)	Subjects
1915–17	Bridgman	16	12–15	100·0	Boys
1932	Leonhardt	41	3–14	83·0	Children
1934	Braun-Menéndez and Orías	100	20–25	60·0	Men students
1934	Clerc *et al.*	33	16–51	33·3	Normal subjects and hospital patients
1935	Pereira	50	18–43	32·0	Pregnant women
1937	Caeiro and Orías	20	N	65·0	Students
1940	Mannheimer	135	0–14	69·6	Boys and girls
1944	Frost	169	N	10·7	Hospital patients
1946	Carlgren	150	3–17	78·0	Boys and girls
1951	Present investigation	123	17–32	40·7* 100·0†	Men and women students

N = not mentioned.
* Logarithmic.
† Linear and stethoscopic.

The modern electronic phonocardiograph, with its great powers of selective amplification, makes it possible to compare all the vibrations produced at the surface of the chest by the beating heart with the audible components of these vibrations.

The object of the present investigation was threefold: (1) To find the incidence of audible vibrations at the time of the third heart sound in a group of healthy young adults. (2) To ascertain whether or not vibrations (audible or inaudible) were produced by the heart at the time of the third sound in all the subjects tested. (3) To find the degree of agreement between observers on the presence or absence of a third heart sound in the subjects examined and the degree of agreement between the findings by auscultation and by phonocardiography.

Details of Investigation

Observers.—Three observers took part in this investigation. All had normal hearing as tested by routine audiometry, but they were of different degrees of experience in listening to heart sounds. Observer 1 (A. S. H.) had practised general medicine for 27 years, with a special interest in cardiology; observer 2 (A. W. S.) had practised for 10 years, again with a special interest in cardiology; while observer 3 (F. W. C.), since qualifying in medicine five years previously, had had little occasion to listen to human heart sounds.

Apparatus.—The binaural stethoscopes employed for auscultation were of a standard pattern with a simple conical chest-piece, 2 in. (51 mm.) in diameter, as illustrated in Fig. 1 *a*.

The phonocardiograph employed has recently been described (Campbell, Sloan, and Andrew, 1952). This instrument can record all vibrations produced at the front of the chest by cardiac activity: such a record is a "linear" phonocardiogram. By the introduction of a length of stethoscope tubing between the standard chest-piece and the crystal microphone, as shown in Fig. 1 *b*, a "stethoscopic" record may be obtained. Finally, by a system of electronic filters, while still retaining the stethoscope tubing, it is possible to introduce selective attenuation of the low-frequency vibrations until the frequency response of the phonocardiograph closely resembles that of the human ear when a stethoscope is used: this yields a "logarithmic" phonocardiogram. A jugular phlebogram was used as reference tracing during each recording, and in each subject an additional record was taken with an electrocardiogram as reference trace.

Subjects.—The subjects of this investigation were students at Glasgow University. At this university all students are encouraged to report annually to the Student Health Service for routine medical examination; during the session 1950–1 30.9% of them did so. In order to obtain as nearly as possible a representative cross-section of the student community every fifth student who reported for medical examination during the Martinmas term (October–December), 1950, was asked to be a subject for this investigation. Out of a total of 125 students who were asked, 123 did offer themselves as subjects, so we feel that our results are reasonably representative of the students as a whole. Of the subjects, 96 were men and 27 women: their ages ranged from 17 to 32 years, with approximately 87% under the age of 25 years. It so happened that none of them had any evidence of heart disease, either primary or secondary.

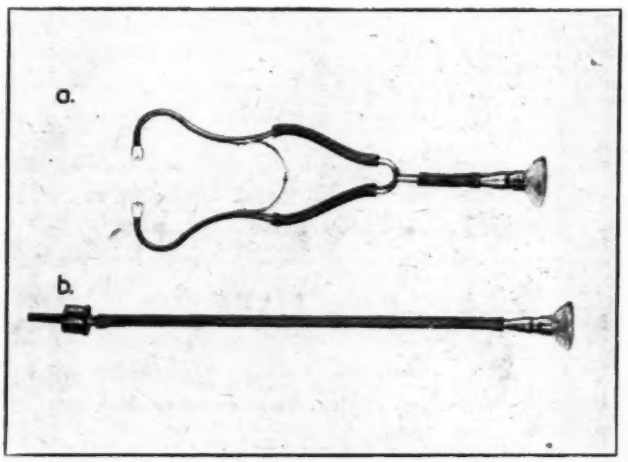

FIG. 1.—Standard stethoscopes: a, for auscultation; b, for phonocardiography.

Procedure

Each subject was listened to by each of the three observers independently, not necessarily on the same day. Auscultation was performed at the cardiac apex with one of the standard stethoscopes, the subject being supine and rested for approximately five minutes. An occasional third heart sound was ignored, but a regularly recurring one was noted as a positive finding.

For phonocardiography the subject was again supine and rested for approximately five minutes. Heart sounds were recorded at the apex with the breath held at the end of expiration.

Measurement of the loudness of heart sounds is at present difficult, but some form of standardization is required: in this investigation, as in that by Luisada and Roitman (1948), the amplitude of the third sound vibrations was measured against that of the first and second sounds. The gain of the amplifier system was adjusted so that the final photographic record of the first or second sound deflections, whichever was greater, was not less than 1 cm. and not more than 2 cm. With this as a standard, any deflection occurring in the position of the physiological third heart sound in at least three successive cycles was taken as indicating the presence of the sound: otherwise the sound was judged to be absent.

The position of the third heart sound on the phonocardiogram was determined by reference to the simultaneous jugular phlebogram. The third sound starts at a time corresponding to the down-stroke or to the foot of the v wave of the venous pulse. This distinguishes it from a split second sound, which occurs before the apex of the v wave (Orías and Braun-Menéndez, 1939), and from an "opening

snap of mitral valve," which starts at the summit of the v wave (Margolies and Wolferth, 1932).

Results

Auscultation.—The third heart sound was heard by a majority of the three observers in 12 cases (9.8%). Observer 1 reported a third sound in 11 subjects, observer 2 in 12 subjects, and observer 3 in 26 subjects. Agreement between the three observers on the presence or absence of third heart sounds was of a low order but definitely significant.

Phonocardiography.—In the phonocardiograms a definite deflection was seen in the expected position for the third sound vibrations in every linear and stethoscopic record from all subjects. In the logarithmic phonocardiograms deflections in the position of the third heart sound were recorded in 48 cases (39.0%).

Fig. 2 shows a typical set of records from a single subject with a third heart sound recorded on the logarithmic phonocardiogram.

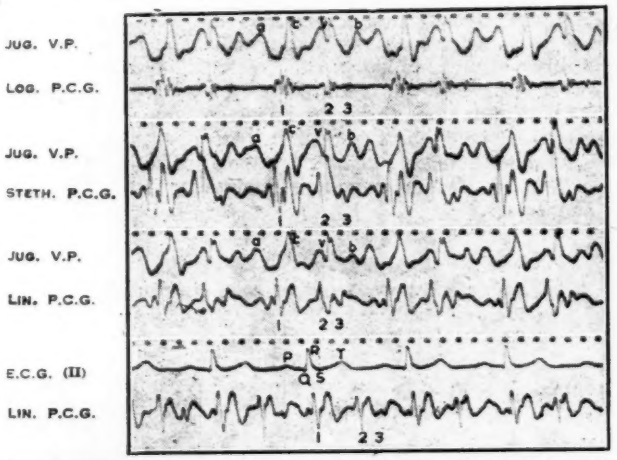

FIG. 2.—Set of phonocardiograms (logarithmic, stethoscopic, and linear) from one subject. Reference tracings, jugular venous pulse or electrocardiogram (Lead II). Time marking in 1/10 second in all records.

Table III summarizes the correlation between the observers' decision regarding the presence or absence of a third heart sound on auscultation and the appearance of a third heart sound on the corresponding logarithmic phonocardiogram. The correlation is significant only in the case of observer 2.

TABLE III.—*Incidence of Third Heart Sound in 123 Young Healthy Adults*

Auscultation Heard by Observers	Phonocardiography (logarithmic)	
	Recorded	Not recorded
None	29	60
No. 1 only	1	1
No. 2 only	3	1
No. 3 only	8	8
Nos. 1 and 2	2	0
Nos. 1 and 3	2	2
Nos. 2 and 3	1	2
Nos. 1, 2, and 3	2	1

Discussion

There is marked disagreement between different investigators regarding the incidence of the physiological third heart sound even in young people, whether the means of investigation be auscultation or phonocardiography.

It is quite clear that in all our subjects vibrations were transmitted to the front of the chest early in diastole during the rapid filling of the ventricles with blood. Only in certain subjects, however, were these vibrations of such amplitude and frequency at the front of the chest that they could be heard on auscultation or detected by a phonocardiograph adjusted to have characteristics resembling those of the human ear.

Further work on the third heart sound must obviously depend on establishing physical criteria for its identification. The ears of clinicians, however skilled and experienced the clinician may be, can hardly be regarded as satisfactory standards of reference. Phonocardiographs, too, are of very different design, and phonocardiography may be misleading unless care is taken to give the physical constants of the instruments used.

Mannheimer (1940) was the first to devise a feasible method for the calibration of a phonocardiograph. Rappaport and his colleagues (1951, personal communication) have made much progress in this direction. Both are able to express the amplitude of the phonocardiogram in terms of absolute units.

Our findings show that future work on the third sound, and indeed phonocardiography in general, would be greatly benefited were some authoritative body to define in physical terms what phenomena are to be accepted as "heart sounds." Then comparisons could profitably be made between the sounds in different individuals, and changes in the incidence and character of the sounds could be followed and interpreted with some confidence.

Summary

In a group of 123 university students aged 17 to 32 years, without evidence of heart disease, a third heart sound was heard by a majority of three observers in only 12 cases (9.8%). On the other hand, deflections occurred in the position of the third heart sound in the linear and stethoscopic phonocardiograms of all the subjects (100%) and in the logarithmic phonocardiograms of 48 of them (39.0%). These results are compared with the findings of previous observers.

Agreement between observers on the presence or absence of the third heart sound was of a low order but definitely significant. There was little agreement between the auscultatory findings and the logarithmic phonocardiograms.

A plea is made for adequate calibration of phonocardiographs so that the results obtained with different instruments may usefully be compared.

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A SATISFACTORY COLPOCLEISIS COMBINED WITH ANAL CLOSURE AFTER SEVERE DAMAGE TO BLADDER AND RECTUM BY RADIUM

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The results of repair of vesico-vaginal fistulae, especially those caused by radium burns, are far from satisfactory, in spite of the fact that the treatment of the simpler type of case was put on a practical basis 100 years ago by Marion Sims (1852). Very few surgeons can show a large series of successful cases. Each case must be treated on its own merits, and no one operation appears to be suitable for all cases.

Among the procedures that have been suggested for overcoming an extensive destruction of the bladder wall is that of vaginal closure (colpocleisis). Miller (1935) and Mahfouz (1929, 1938) condemn this operation as unanatomical and unphysiological. They refer, however, to the colpocleisis which was originally described by Simon (1856), where the upper half of the vagina is closed off from the lower half, leaving a sacculation which is very apt to have a phosphate stone form in it.

The colpocleisis described by Latzko (1942), where part of the vagina is taken to repair the fistula and no diverticulum is subsequently formed, seems to give more satisfactory results. If the sphincter of the bladder is destroyed a satisfactory result is extremely difficult to obtain, though a few cases have been reported in which a subsequent sling operation of the Aldridge type has been successful in controlling the urine. As a rule more drastic operations are required, such as transplantation of the ureters.

In cases of vesico-vaginal fistulae complicated by damage to the bladder neck, and further complicated by recto-vaginal fistulae, a colpocleisis with removal of the urethra has been occasionally described, the urine draining direct into the rectum (Te Linde, 1946; and Crossen and Crossen, 1948). This operation cannot be performed unless there is a functional anal sphincter.

Radiation therapy causes further complications, as radium destroys the vessels in the tissue, thus limiting the blood supply necessary for healing. Another difficulty with this type of tissue is its lack of elasticity and its tendency to fibrosis, thus preventing satisfactory approximation.

In 234 cases of vesico-vaginal fistula reported by Mahfouz (1929) there were five in which a colpocleisis was performed; according to Mahfouz the end-results were, however, unsatisfactory for the reason stated above. Moir (1947) reported 40 cases of fistula, one of which was a combined vesico-vaginal and recto-vaginal fistula caused by necrosis of the vagina after radiation treatment of carcinoma of the cervix. This case was dealt with by a high colpocleisis, and with continuing satisfactory results.

Case Report

In 1942 the patient, then aged 17, gave birth to her first-born son. Two years later she had her second baby, born one month prematurely, who died when only 8 weeks old. Nothing abnormal was noticed for a year, when, at the age of 20, she had intermittent bleeding for a month. A carcinoma of the cervix and anterior vaginal wall was found and confirmed by biopsy; it was treated by radium over the next 18 months, the last treatment being given in September, 1946. Four months later, in January, 1947, a brown vaginal discharge was noticed, which rapidly increased until it was obvious that both urine and faeces were being passed per vaginam.

On examination she was seen to be a pale thin woman of West Indian extraction, weighing 7 st. 1 lb. (44.9 kg.). Her mouth and teeth were in good condition, and no abnormality was detected in the cardiovascular or respiratory system. Nothing abnormal was palpated in the abdomen, which was lax because of previous pregnancies. The skin of the thighs between the legs was excoriated by the constant irritation of the urine and having to wear protection. An offensive smell of decomposing urine was obvious. Vaginal examination showed a large, whitish, irregular sloughing mass occupying the whole of the introitus. There were two small passage-ways through this sloughing tissue, one leading into the upper vaginal vault (although neither cervix nor uterus could be palpated) and the other leading through to the rectum. Rectal examination showed that the perineal body was almost entirely gone. About 1 in. (2.5 cm.) above the anus an annular constriction could be felt, and in passing this constriction the examining finger entered the vagina. The haemoglobin was 70%, and tertian gametes of malaria were found in the blood smear.

Treatment

A left lower colostomy was performed through a muscle-splitting incision, with a view to ridding the vaginal tissue of contamination. The colostomy acted regularly from the start, and in a short time healthy granulation tissue was noticed around the fistulae. Pelvic examination was still difficult on account of the scar tissue left by the radium, but a cystic mass was felt in the anterior part of the vagina, and was thought to be a cystocele. The actual fistula into the bladder was not identified.

FIG. 1.—Lithotomy view, showing the suture line from the region of the coccyx to the clitoris.

Four months after the colostomy an attempt was made to repair the vesico-vaginal fistula. The cystic mass inside the vagina, thought to be a cystocele, was found to be an extroverted bladder. When this was replaced a very large fistula into the bladder was identified. All that remained of the urethra was a small tunnel of mucous membrane less than 1 in. (2.5 cm.) long. The sphincter into the bladder had been completely destroyed. The tissue around the bladder was accordingly freed and the fistula closed, a self-retaining catheter being left in the urethra. This operation, however, was unsuccessful.

In April, 1948, four months after the previous operation, another attempt was made to repair the fistula. A small suprapubic incision was made, and the bladder, pushed up from below, was sutured to the rectus sheath, thus preventing extroversion. Rather than attempt to close the large fistulous opening, a partial colpocleisis was performed, using the labia minora for the purpose. In the hope that the remainder of the urethral canal could still be used, the vagina was closed around the urethra and a self-retaining catheter inserted through the short urethra into the bladder.

The unusual step was now taken of closing the anal canal; this was done because of the incontinence of the anal sphincter. This operation was only partially successful, as the urine was now passing through a smaller fistula. There was still incontinence, and the patient, rather discouraged, returned to the country.

On February 17, 1949, 10 months later, the colpocleisis was completed, with the complete closure of the vagina. Portions of tissue were removed on each side of the vagina, beginning in the region of the coccyx, until the clitoris was reached. Inner and outer cuffs were raised and the inner cuffs approximated. A few buried sutures were inserted before closing the outer cuffs. As a result the whole of the anal canal and vagina was completely closed, leaving the clitoris as the only external landmark of the vestibule (Fig. 1). Before complete closure a catheter was passed down the distal opening of the colostomy until it was seen in the vagina. The catheter acted as a continual post-operative drain for the newly formed "bladder."

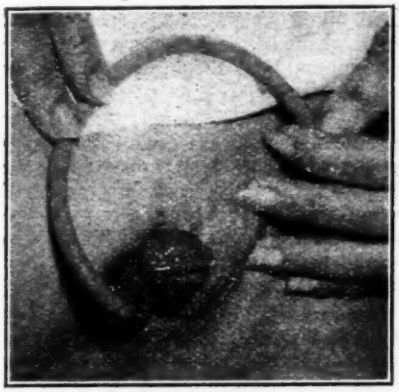

FIG. 2.—Front view showing the patient herself inserting the catheter down the distal opening of the colostomy, to empty the "bladder."

Uninterrupted recovery gave encouragement, and after 10 days the patient was walking around emptying the "bladder" herself by passing a catheter through the distal orifice of the colostomy as occasion demanded (Figs. 2 and 3). This was the first time the patient had been dry for two years. An intravenous pyelogram showed satisfactory function of both kidneys.

At the time of writing, two and a half years after the final operation and six and a half years after the diagnosis of the cancer, the patient was extremely fit, having put on 35 lb. (15.9 kg.) in weight. The colostomy and bladder were both working well; there was no need to wear a colostomy bag or belt, as she is forewarned when either the proximal or distal loops of the bowel require to be emptied. No sign of menstruation had been seen since the radium treatment.

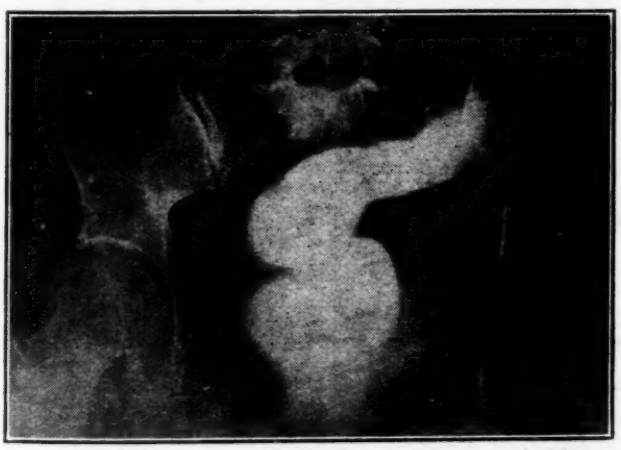

FIG. 3.—Radiograph showing retrograde filling of the "bladder" with a solution of potassium iodide, from a catheter inserted into the distal orifice of the colostomy. The shadow outlines the pelvic colon, vagina, and remains of the true bladder. Intravenous pyelography had previously shown satisfactory function of both kidneys.

Summary and Conclusion

There are few operations so satisfactory to patient and surgeon as a successful closure of a vesico-vaginal fistula. Such a distressing condition, with the constant odour of decomposing urine, prevents the patient mixing in society. David of old seemed to recognize this when he said: "My lovers and my friends stand aloof from my sore; and my kinsmen stand afar off" (Psalm xxxviii. 11).

A case is described of extensive damage to the bladder and rectum following the use of radium for carcinoma of the cervix uteri and vagina. The double incontinence was treated by providing an inguinal colostomy and completely closing the vagina and anal canal.

An excellent result was obtained, and the patient is now in good health and enormously improved in mental outlook. So far as is known to me, this procedure is unique.

My thanks are due to Professor Chassar Moir, of Oxford, Mr. Oswald Lowsley, of New York, and Mr. Donald Fraser, of St. Bartholomew's Hospital, London, for their encouragement, and to Mr. F. W. W. Bailey, of Jamaica, for the *x*-ray photograph.

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HAEMATOMA OF THE ADRENAL GLAND IN THE NEWBORN

BY

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AND

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Haemorrhage of microscopic dimensions in the adrenal gland is often found in the neonatal period, but massive unilateral haemorrhage has been infrequently recognized and only a few cases have been described. Yet the cases present a fairly clear clinical picture, enabling the diagnosis to be made during life and effective treatment instituted.

Talbot (1900) seems to have been the first to draw attention to the condition in this country, but since his description there have been barely a dozen articles on the subject. Stock (1947), reviewing the publications on cysts of the adrenal gland up to that date, was able to find only 50 recorded cases. Most of these were said to be lymphangiectatic or haemorrhagic, but no specific mention is made of their occurrence in the neonatal period.

Kohlbry and Wells (1945) found 3 cases of unilateral adrenal haemorrhage among 452 stillbirths and neonatal deaths in a total of 9,500 births. Arnold (1930) reported

two cases which were diagnosed at necropsy and two others in which the diagnosis was made during life, one child being successfully treated.

In common with other conditions occurring in the neonatal period, it is likely that the incidence is higher than is generally supposed, for in this age group clinical diagnosis is difficult and the certification of deaths is notoriously inaccurate.

Case 1

A 10-day-old baby was referred to the medical out-patient clinic with a letter, from which the following is extracted: "Two days after delivery he became pale, irritable, eyes inclined to roll, persistent and irritable cry, temperature 101°." A mass had been felt in the abdomen.

The baby was the first child of healthy parents. The pregnancy had been normal and the baby was born at full term after the mother had been in labour for three days. Delivery by forceps was not difficult. The child was put to the breast on the first day, but seemed very sleepy and did not suck. On the second day he was pale and irritable, the temperature was 101° F. (38.3° C.), and he would take nothing except a little glucose-water. Sulphadiazine was given. On the third day he was very weak and could not take from the breast. On the fourth day he was still looking pale, and was given 5 ml. of the mother's blood into the buttock. From this time he appeared to improve, taking feeds rather better and gaining some weight. On the seventh day his temperature rose to 105° F. (40.6° C.); penicillin, 100,000 units every six hours, was begun and sulphadiazine continued. The child was admitted to hospital at the age of 10 days. His temperature was 99.4° F. (37.4° C.), and pulse 148. The baby was quiet and his colour was normal. There was slight wasting of the subcutaneous tissues but no other abnormality apart from the right loin, where a mass could be palpated bimanually. The swelling measured about 10 by 6 cm.; it was firm and clear in outline and was thought to be of renal origin. The urine showed no abnormality. The blood count showed: haemoglobin, 11.6 g.%; red cells, 3,500.000 per c.mm.; white cells, 11,000 per c.mm. (44% polymorphonuclear leucocytes). The blood urea was 28 mg. per 100 ml. A cystogram revealed no abnormality of the bladder, and the dye did not enter the ureters. Intravenous pyelography, using 8 ml. of 70% diodone, showed good excretion from both kidneys. On the right side the kidney appeared to be displaced downwards and outwards, and the upper pole was tilted outwards. This suggested a displacement of the upper pole of the kidney by some mass just above it. A radiograph of the chest was normal.

At this time (eight days after admission) the child appeared to be thriving, but, in view of the possibility of neoplasm, laparotomy was thought advisable.

Operation was undertaken on March 25, when the child was 3 weeks old. The kidney appeared normal in size and shape, but was displaced downwards by a cystic mass just above it. This mass seemed to be more than 5 cm. in diameter, and on aspiration some blood was obtained. The wall of the mass disintegrated fairly easily, and in all about 10 ml. of thick blood-stained fluid was removed. No attempt was made to excise the wall of the cystic mass, and the abdomen was closed.

The post-operative course was smooth and a subsequent radiograph revealed that the kidney was in the normal position and was excreting well. The child had begun to thrive just before operation, and continued to do so afterwards.

Case 2

A baby girl was delivered by a midwife four days after the expected date of delivery. The mother, aged 41, had four other children, who were well. The pregnancy was normal, and labour lasted about 10 hours. Delivery was straightforward; the child cried well and had a good colour. She was put to the breast nine hours after birth, suckled well, and appeared completely normal until the second day. When approximately 40 hours old she began crying incessantly and could not be consoled. This continued for about five hours, when the infant "fell asleep" and was found dead by the midwife one hour later.

Necropsy, at the coroner's request, showed a mature but extremely pale female child weighing 7 lb. 15 oz. (3.6 kg.) and 20 in. (51 cm.) long. No external anatomical abnormalities were found.

The peritoneal cavity contained about 30 ml. of blood-stained fluid, and there was a blood clot, approximately 10 by 3 by 1 cm., lying transversely across the abdomen. No naked-eye tears in the peritoneum were seen. The right adrenal gland was converted into a globular haemorrhagic sac, and there was an extensive extravasation of clotted blood surrounding the right kidney and extending beneath the peritoneum to the pelvis and into the root of the mesentery. The renal and adrenal vessels were surrounded by blood clot. The left adrenal gland and kidney seemed to be normal. All other organs in the body were unusually pale but otherwise normal, and no thrombosis of vessels was found.

Microscopy showed a moderate amount of alveolar oedema in the lung but no significant lesion in organs other than the right adrenal. The latter appeared to be almost completely destroyed, the only remaining organized parenchymal tissue being small groups of the most superficial cortical cells immediately in contact with the capsule. The left adrenal appeared to be normal.

Sections taken across the adrenal veins showed them to be collapsed and empty; no thrombi were seen. The blood vessels of the adrenal gland lay within a mass of blood clot, which in some areas was quite fresh whilst in others it showed lamination. The anatomical diagnosis was that bleeding had occurred into the right adrenal gland with rupture of the gland; the immediate cause of death was internal haemorrhage.

Discussion

Many of the cases of adrenal haemorrhage reported in the literature (Langmead, 1904; Rabinowitz, 1923) occurred in older children and, being associated with generalized purpura and sepsis, fall into the category of the Waterhouse–Friderichsen syndrome. Another group of cases occurs in the newborn and is characterized by multiple haemorrhages. The type of case we have described, however, was recognized by Talbot in 1900, and has since been described by a few authors. The principal features of these cases are summarized in the Table.

Summary of Cases in the Literature

Author	Onset of Symptoms	Maximum Symptoms	Outcome	Adrenal Affected	Tumour Palpable in Abdomen
Talbot (1900) ..	—	5 days	Died	R	No record
,, ,, ..	—	3 ,,	,,	—	,, ,,
,, ,, ..	—	4 ,,	,,	—	,, ,,
,, ,, ...	—	14 hrs.	,,	—	,, ,,
Corcoran and Strauss (1924)	4 days	5 days	Recovd.	L	Yes
Goldzieher and Greenwald (1928) ..	24 hrs.	4 ,,	,,	R	,,
Arnold (1930) ..	4 days	4 ,,	Died	R	No record
,, ,, ...	3 ,,	3 ,,	Recovd.	—	Yes
,, ,, ..	3 ,,	3 ,,	,,	R	,,
,, ,, ..	3 ,,	3 ,,	Died	R	No record
Kohlbry and Wells (1945)	4½ hrs.	2 ,,	,,	R	Yes
,, ,,	3 days	3 ,,	,,	L	No record
Present Case 1 ..	2 ,,	3 ,,	Recovd.	R	Yes
,, ,, 2 ..	40 hrs.	45 hrs.	Died	R	No record

Although there is some variation in the symptomatology of these cases, a general pattern is discernible. The baby appears to be normal at birth after an uneventful pregnancy and a straightforward delivery. A few hours, or at the most a few days, after birth the baby becomes ill, will not take feeds, and becomes noticeably pale. There is invariably some pyrexia, sometimes of extreme degree. The baby

may be restless, but in the later stages becomes weak and comatose. A mass is often palpable in the loin. Death may occur with dramatic suddenness.

The three principal aspects for discussion are the cause of the haemorrhage, the cause of death, and the treatment. if any.

Cause of the Haemorrhage.—It has been suggested that trauma during labour or delivery is the factor responsible for massive unilateral adrenal haemorrhage (Mitchell–Nelson, 1950). Cases in adults have been reported in which haemorrhagic cysts of the adrenal have followed trauma. However, it is difficult to understand how the adrenal glands, which are unusually well protected from external trauma, could suffer during normal labour or could be damaged during delivery without external signs of injury. Moreover, in our two cases delivery was quite straightforward.

Venous thrombosis, a fairly common occurrence in the neonatal period, could be a causal factor, but cases of adrenal vein thrombosis without gross haemorrhage are not rare. Moreover, in Case 2 the adrenal veins were found to be empty. It is conceivable that massive haemorrhage into the adrenal gland could be part of the picture of haemorrhagic disease in the newborn which may produce bleeding from one site only. Prothrombin estimations were not done in these cases, and no definite conclusion is possible concerning this suggested cause. A further possibility which several authors have entertained is that there is excessive degeneration of the foetal cortex. It would seem strange if this tendency were manifest on one side only; the adrenal gland on the opposite side in Case 2 appeared to be normal.

Cause of Death.—Acute adrenal insufficiency has been suggested as the immediate cause of death, but this seems to be unlikely. In the neonatal period the medullary and the chromaffin tissue are situated principally outside the adrenal gland, and the gland itself consists largely of involuting foetal cortex (von Reuss, 1920). Furthermore, Zuelzer (private communication) describes a case in which a child died when 8 days old, both adrenals having been destroyed by haemorrhage. He believes that the haemorrhage had occurred at birth, and that the child had lived for eight days virtually without adrenals. In the fatal cases so far reported the severity of the haemorrhage seems to have been a sufficient cause of death—particularly when there has been rupture of the haemorrhagic mass into the peritoneal cavity. The clinical picture is also in keeping with the diagnosis of severe internal bleeding.

Treatment.—Mild cases in which the haemorrhage is self-limited will need no treatment—in fact, many will pass unrecognized. In others the bleeding is so rapid and profuse that the infant is dead before effective measures can be started. In cases of intermediate degree early recognition of the condition and the administration of blood transfusion may be life-saving.

Summary

Two cases of unilateral neonatal haemorrhage of the adrenal gland are reported and the symptomatology is described.

The aetiology of the haemorrhage and the cause of death are discussed.

It seems probable that some of the more severe cases might be saved by early and vigorous efforts to deal with internal haemorrhage.

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ARTERIAL SPASM DUE TO AN INTRAVENOUS INFUSION

BY

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The following case provides an example of an unusual danger that may be encountered in the common surgical procedure of "putting up a drip."

Case Report

A bricklayer aged 52 was admitted to hospital with frequency and dysuria attributable to a myoadenoma of the prostate. He was otherwise quite healthy and no abnormalities were detected in his cardiovascular system. His blood pressure was 120/90, and his blood urea 29 mg. per 100 ml. Transvesical prostatectomy was performed (Mr. Roche), the anaesthetic being thiopentone, nitrous oxide, trichloroethylene, and D-tubocurarine chloride. On return from the theatre the patient was pale and his skin was moist. His pulse rate was 120 and blood pressure 105/75. The foot of the bed was raised on blocks, and it was decided to administer an intravenous saline infusion. The left median cubital vein was selected. French's needle from the transfusion set pierced the skin and vein wall as one, and entered the vein smoothly without any manipulation or withdrawal being necessary. Normal saline was infused at the rate of 60 drops a minute. The needle and tube were fixed in position by strapping and the whole arm was loosely bandaged to a splint. When the apparatus had been set up completely there appeared to be nothing untoward occurring, and no difference in the colour of the left hand and that of the rest of the body was observed. The patient was not in any way restless.

One and a quarter hours later it was noticed that the left hand and forearm were pale and cold, and the tips of the fingers of the left hand were slightly cyanosed; also, the intravenous drip had stopped. It had not run into the tissues. Neither the radial nor the ulnar pulse was palpable. The brachial artery was pulsating strongly down to a point about ¾ in. (1.9 cm.) proximal to the site of the intravenous infusion, but distal to this it could not be felt. Pressure on the palm of the left hand produced a blanching which persisted for about three minutes. Auscultation of the heart revealed no abnormality except that of the tachycardia (120 a minute) that was present. There appeared to be no source of origin for an embolus, but it did seem possible that the intravenous infusion was a traumatic factor, and so a diagnosis was made (later confirmed by operation) of spasm of the brachial artery. On disconnecting the infusion apparatus it was noticed that a small clot obstructed the terminal orifice of the needle. A radiant-heat chamber was placed over the patient in order to encourage cutaneous vasodilatation.

The pulse not having returned in 15 minutes, the patient was taken to the operating theatre. He had not regained consciousness from the anaesthetic given that afternoon, and anaesthesia was continued with cyclopropane and oxygen. Procaine, 4 ml., was injected subcutaneously into the left antecubital fossa. A 3-in. (7.6-cm.) longitudinal incision was made in the antecubital fossa over the line of the brachial artery. A portion of the median cubital vein 1½ in. (3.8 cm.) long was resected; it included the site of the infusion. There was no evidence at operation that saline had leaked out into the tissues. The bicipital aponeurosis was incised and the brachial artery exposed. Bleeding during this dissection was almost completely absent even though no tourniquet was being used. The brachial artery was narrow and pulseless. The vasa vasorum were empty, making the wall of the vessel appear white. There was a small red circular area about ¼ in. (3 mm.) in diameter situated in the wall of the brachial artery almost underlying that part of the median cubital vein into which the infusion had been given.

As the artery was being freed from adjacent tissues by gentle dissection with Lahey swabs it started pulsating, but this was minimal and just perceptible at the wrist. A solution of 1 in 80 papaverine sulphate was applied to the surface of the artery in the form of drops. The artery visibly dilated and pulsation became stronger. The vasa vasorum filled and the surface of the vessel became pink. At this stage the pulse was readily perceptible at the wrist and colour returned to the hand and forearm. The papaverine was then washed off with saline and the skin sutured directly without any attempt being made to close the incision in the bicipital aponeurosis. Cotton-wool was loosely bound around the wound and the patient was returned to the ward.

The resected specimen of the median cubital vein was examined. There was a puncture wound in the superficial part of the vein through which the infusion had been given, but the deep surface showed no signs of trauma or any indication that the needle had transfixed the vein and so possibly impinged upon the artery.

The next day the patient felt quite well apart from "soreness" of the tip of his left index finger. There was an area of brownish-black discoloration, about ¼ in. (6 mm.) in diameter, at the tip of the left index finger. This was slightly tender to touch. There were no other relics of the arterial spasm that had occurred a few hours before.

Comment

Spasm of the main artery of a limb is a well-recognized condition which may follow trauma to the arterial wall. This trauma may be caused by the passage of shrapnel or bullets close to the artery, as described in the cases of Küttner and Baruch (1920), or may occur during an operation in which there has been some manipulation of an artery. It may follow supracondylar fractures of the humerus, and Griffiths (1940) has brought much clinical and operative evidence to show the importance of this phenomenon in the development of Volkmann's ischaemic contracture. Griffiths quotes a case in which a tourniquet was accidentally left in place for six hours; 18 hours later, the symptoms of ischaemia persisting, the limb was explored and the femoral artery was found to be in a state of spasm. It has also been known to occur as a complication of arteriography, but most of these cases are instances of true primary thrombosis (G. J. Hadfield, 1952, personal communication).

The case reported here is interesting because the trauma to the artery, if existent at all, must have been minimal. The induction of the infusion appeared to be smooth. The patient was not restless, and therefore it is unlikely that he moved his own arm during the infusion and so traumatized the artery. The operation revealed no signs that the artery had been injured, apart from the small area of redness in its wall, and this could possibly have been an artifact occurring as a result of freeing the artery by dissection. It is interesting to speculate whether the presence of saline, at a lower temperature than that of the blood, passing through a vein close to an artery could have any adverse effect on the arterial wall.

Kinmonth (1952) has shown that in rabbits a gradual fall in blood pressure is associated with a parallel shrinking of large arteries. If we can postulate this state of affairs in man, then in post-operative shock, a condition associated with a fall in blood pressure, it is possible that there is an increased susceptibility to spasm of large arteries. This may apply to the case described above. The spontaneous termination of the intravenous infusion may be explained on the basis of venous stasis due to an impaired arterial supply leading to an impaired venous return.

This case is also of interest because it shows that, in common with many previously reported cases of arterial spasm (Cohen, 1940), mere exploration and freeing of the vessel was enough to restore some degree of blood flow to the limb.

The treatment employed in this case—namely, the local application of papaverine sulphate—is of interest in view of the experiments recently carried out by Kinmonth (1952). Various smooth-muscle-relaxing agents were tested for their ability to relieve arterial spasm. It was shown that papaverine was the most consistently successful in producing relaxation, which did not retrogress when the drug was removed.

I wish to thank Mr. A. E. Roche for permission to publish details of the case. I am also indebted to Mr. G. J. Hadfield for helpful advice and to Mr. J. C. B. Serjeant, who operated for the arterial spasm.

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PHAEOCHROMOCYTOMA WITH FATAL MYOCARDIAL INFARCTION IN A MAN AGED 22

BY

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Phaeochromocytoma is being reported with increasing frequency; about 194 cases were recorded up to 1950 (Walton, 1950), and four more have been described in the *British Medical Journal* alone in the past year (Swan, 1951; Crowther, 1951; Pantridge and Burrows, 1951). Nor is myocardial infarction in young persons rare enough to merit the report of a single case, several series having been published since 1937 (Scott, 1938; French and Dock, 1944; Newman, 1946, 1951). Myocardial infarction in a young hypertensive subject with phaeochromocytoma might occasionally be expected to occur, but I have been able to find only two references to this combination (Goldenberg *et al.*, 1947; Wilkins *et al.*, 1950).

The following case is remarkable for the short period of disability, the patient having remained at work, apart from two brief intervals (one for hospital investigation), until ten days before death; the degree of cardiac enlargement; and the evidence of multiple myocardial infarcts, old and recent.

Case History

The patient, a farm-worker aged 22, had been subject to severe headaches for two years. While fielding at a cricket match he collapsed, with burning substernal pain, and was taken home, where he remained in the care of his doctor for four days. The pain subsided in a few hours, but on the fourth day he showed evidence of left ventricular failure. Orthopnoea and cyanosis were present, the pulse was 130, the apex beat was in the sixth space in the mid-axillary line, and there was presystolic gallop. Basal rales were heard and the blood pressure was 136/120.

On his admission to hospital an *x*-ray film of the chest, sitting, showed gross cardiac enlargement and some pulmonary congestion (Fig. 1); and an E.C.G. showed the changes of a posterior infarction. He improved for four days; there was no further pain, the dyspnoea and cyanosis had subsided, the pulse rate fell, and the gallop became inaudible. He died abruptly on the fifth day after admission, the tenth after his collapse on the cricket field. Death was instantaneous and not associated with unusual movement or effort.

Earlier History.—He had lived and worked on a farm all his life, and, apart from what were described as occasional "sick headaches" in adolescence, had had good health.

playing football and cricket regularly till the onset of his terminal illness. At the age of 20, however, his headaches had become more frequent and seyere. Mainly frontal, they began mid-morning, continuing all day. Occasionally he vomited, and sometimes had black spots in front of his eyes. When he first sought advice the headaches were occurring once or twice a week; fiis blood pressure was then found

FIG. 1.—Radiograph of the chest taken in the sitting position with portable machine.

to be elevated, and he was referred to the General Hospital, Birmingham, in August, 1947. He was there seen to be a well-built healthy-looking young man of 12 stone (76.2 kg.) (having lost 2 stone (12.7 kg.) in the last six months). His blood pressure varied between 160 and 240 systolic and 120 and 160 diastolic. The apex impulse was 1½ in. (3.8 cm.) outside the mid-clavicular line, and, apart from an accentuated aortic second sound, the heart was normal. The retinal vessels were somewhat narrowed and tortuous, but no other changes were seen. Full investigation of renal function, including intravenous pyelography, showed no evidence of impairment. *X*-ray films showed some prominence and widening of the aorta but no obvious increase of the cardiac shadow. Intravenous tetraethylammonium bromide, 500 mg., produced a *rise* in blood pressure from 184/138 to 240/184, reverting to the previous level in 11 minutes; there was no rise in skin temperature of the legs. Amytal-depression and cold-pressor tests gave no significant response. The patient was considered unsuitable for lumbo-dorsal sympathectomy, and was discharged.

In 1948 he remained fairly well apart from headaches about once a week, but he began to have profuse sweats. In March, 1949, his doctor had noted some cardiac enlargement, a mitral systolic murmur, a pulse rate at times of 120, and a blood pressure on one occasion of 170/150. Two months before his final collapse he had a sudden attack of "weakness of the legs and faintness" while out in the fields rabbit-catching; thereafter he remained active until his coronary occlusion in June.

Post-mortem Findings

Heart.—The pericardial sac contained blood-stained fluid. The heart, when removed from the body and freed from clot, weighed 800 g., the increase in size being largely due to left ventricular hypertrophy. There was an area of scarring and fibrosis in the lateral part of the left ventricular wall and a recent infarction of the posterior wall. At the apex of the left ventricle there were three small areas of haemorrhagic infarction. Atheromatous plaques with adherent thrombi were present in the much-narrowed coronary arteries.

Suprarenals.—The left suprarenal was represented by a tumour weighing 20 g. and measuring 6 cm. in greatest diameter. It presented a smooth external surface; the cut surface showed a yellowish semi-translucent central area surrounded by a narrow more whitened cortical zone. Some tiny flecks resembling lipoid material were discernible; there was no resemblance to normal suprarenal tissue.

Kidneys.—These were normal macroscopically and microscopically.

Microscopical examination of the suprarenal tumour (Fig. 2) showed that it was made up of large epithelioid cells arranged in groups. They were irregular and polygonal, with some vacuolation, and many of the outlines were indistinct. Nuclei were hyperchromatic, and multinucleate forms were present; there was a general superficial resemblance to the cells in the zona fasciculata. The tumour was firmly encapsulated and showed no invasive properties. Placed in chrome cell fixative, it showed typical macroscopic brown coloration; sections of this material revealed a number of cells with chromaffin granules not visible in tissue fixed in formalin. The latter, however, showed the presence of much argyrophil substance. No attempt was made to assay for pressor substances.

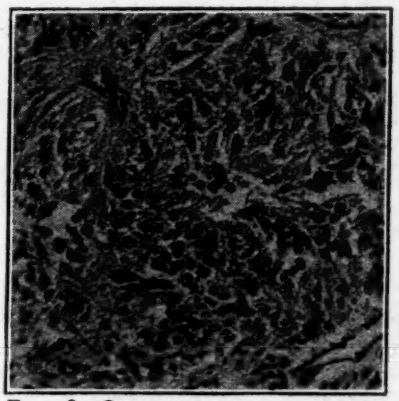

FIG. 2.—Suprarenal tumour, showing prominent vessels with perivascular distribution of cell-columns; many large cells, some multinucleate, are visible. No granules. (H. and E. ×180.)

Morphologically the tumour conformed to standard descriptions (Willis, 1948; Brines and Jennings, 1948; Pinniger and Brown, 1949). In the present instance chromaffin granules could be found by diligent search: their incidence varied greatly even in adjacent cells.

Comment

In adolescence this young man had suffered headaches originally thought to be migrainous; when he was 20 they became severe and led to the discovery of hypertension. At this time there was nothing to suggest the adrenal-sympathetic syndrome; after investigation it was decided that sympathectomy was unlikely to benefit him, and the adrenal tumour escaped detection. In the absence of suggestive symptoms the diagnosis of these tumours is difficult, and had splanchnic resection been attempted, as in Swan's case, the tumour might have been found and successfully removed. Smithwick, quoted by Goldenberg *et al.* (1947), found five cases of phaeochromocytoma among 1,000 hypertensive subjects sent to him for sympathectomy; several authorities have recently emphasized that all young and middle-aged hypertensive subjects should be investigated with this in mind; it may become easier in future with the aid of agents such as "piperoxane." Until lately many of the reported cases, like that recorded here, were diagnosed only after death. The earlier investigations in this case, however, do provide restrospective clues to the true diagnosis—namely, the absence of response to depression and cold-pressor tests, and the *rise* in blood pressure with T.E.A.B.

The first symptom really suggestive of an adrenal medullary tumour—profuse sweating—appeared a year after the hospital investigations had been done, and seems to have

been associated by the patient with exertion; for this reason, presumably, no special attention was paid to it. Questions put to his mother after his death revealed that the sweats were not related to effort. The only other suggestive feature in his history, also elicited after death, was a single attack of "weakness and shaking of the legs," and no further details of this episode are available. The symptoms as known before death were compatible with essential hypertension, which was presumed to have caused the coronary occlusion.

The cardiovascular syndrome, of which this case is chiefly an example, may occur at all ages, mostly from 20 to 50 (Mackeith, 1944). While in hospital in 1947 the patient showed fairly wide fluctuations in pressure, but they lay within the range of variation recognized in essential hypertension and were unassociated then with other features suggestive of hyperadrenalinism. In the subsequent two years of his life blood-pressure readings were infrequent and showed only minor fluctuations in a sustained hypertension. Williams (1950) states that "patients (with phaeochromocytoma) showing persistent elevation of blood pressure may have all the anatomical and symptomatic complications that go with hypertension." None the less, reports of frank coronary occlusion in such patients seem to be rare, and death has usually been recorded as due to cerebral vascular accident, acute left ventricular failure, and renal or hypertensive failure (Green, 1946; Walton, 1950). Wilkins *et al.* (1950) report a case of myocardial infarction following removal of the tumour, diagnosed by E.C.G. in a man of 22 who survived; Goldenberg *et al.* (1950) report one in which infarction was believed to have occurred two years before diagnosis of the tumour.

The reported series of coronary occlusions in young adults (French and Dock, 1944; Newman, 1946, 1951; Reich, 1948) make only brief reference to hypertension because most of the deaths occurred suddenly in apparently healthy men and few previous records of blood pressure were known: the true incidence of hypertension and its relation to coronary disease in the young is uncertain. Phaeochromocytoma was not found in any of these recorded series.

The size of the heart in hypertensive heart disease seems to depend rather on the duration of heart failure than on the duration or degree of hypertension (Harrison and Wood, 1949). My patient showed gross cardiac enlargement, mainly due to left ventricular hypertrophy developing during his last two years of life, since the *x*-ray film taken in 1947 showed no appreciable increase in heart size. It is a remarkable feature of the case that there was little evidence of failure before the fatal coronary occlusion which occurred on the cricket field, and the patient had followed a normal working life (including games) up to that time.

I am indebted to Dr. A. P. Prior for the post-mortem report and the photomicrograph; to Professor F. A. R. Stammers for details of the earlier investigations; and to Dr. C. L. Wharton, of Kineton, for the patient's medical record while under his care at home.

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NYSTAGMUS AND OTHER EYE SIGNS IN ACUTE ALCOHOLISM

BY

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Clinicians often find it difficult to decide whether or not a patient is under the influence of alcohol. The difficulty lies in the fact that the physical signs vary from patient to patient and may be different in the same individual when seen in similar circumstances a second time. The suffused conjunctiva, the dilated pupil, and its sluggish or absent reaction to light have long been used to support an opinion that a given clinical picture was due to alcohol, but little has been said of any other eye signs.

In view of this it was decided to examine in retrospect a random selection of 40 subjects, known or suspected to have taken alcohol, in order to discover the number who exhibited nystagmus or nystagmoid jerks. For the purpose of classification nystagmus was regarded as having a slow component in one direction with a fast return to the opposite, which persisted so long as the subject continued to look at the examiner's finger. The nystagmoid jerks, however, were smaller and faster oscillations in which the components were equal in speed and the phenomena lasted for only a limited time but could be re-established by getting the subject to look ahead and then return his gaze to the examiner's finger.

Source of Clinical Evidence

The material was taken from notes made during the examination of persons believed to be driving motor-vehicles whilst under the influence of alcohol. All the examinations were carried out by me, and took place at four police stations in two divisions of the Metropolitan Police District. Each case was examined in the same manner, details of name, age, address, occupation, and relevant medical history being taken. An attempt was made to get a detailed account of how the previous six hours had been spent, with special emphasis on the events leading up to the arrest. This was then followed by a clinical examination. The emotional upset caused by the arrest and subsequent attendance at a police station produced a rapid sobering effect in some cases, which continued through the period of questioning. It was decided, however, in spite of a possible modification of physical signs, to continue this method of approach because without such initial questioning personal contact between the examiner and examinee was impossible and full co-operation in the examination could not be obtained.

Clinical Findings

Of the 40 cases examined 39 freely admitted taking alcohol. One (Case 38) denied it, and was subsequently found to be suffering from the effects of excessive fatigue and extreme chilling after sleeping in the cab of his truck in mid-winter. Of those examined, 37 were civilians and three (Cases 7, 16, and 23) were members of the United States Armed Forces based in England. All save one (Case 13) spoke English; the exception was a Pole, who was examined with the help of an Italian and later a Polish interpreter.

In testing for nystagmus the patient was asked to follow with his eyes the examiner's index finger first to the extreme right and then to the extreme left. Of the 40 cases examined 16 exhibited a lateral nystagmus and a further 13 showed nystagmoid jerks. Ten of the cases with nystagmus were associated with dilated pupils which did not react to light.

An additional five were associated with dilated pupils which reacted sluggishly to light. Case 11, a genial barrow-boy aged 42, exhibited nystagmus and dilated pupils, one of which was fixed while the other reacted sluggishly to light. This man had been examined some four weeks earlier, when his vegetable van had overturned and he had been suspected of being under the influence of alcohol. Then both pupils were dilated and reacted to light and accommodation, but there was no nystagmus.

Of the 13 cases with nystagmoid jerks five were associated with dilated pupils which did not react to light, three had dilated pupils which reacted sluggishly to light, and two had dilated pupils with a normal light reaction. Three cases with nystagmoid jerks had pupils of normal size which reacted to light. Two of these (Cases 27 and 28) had been removed from wrecked vehicles, while Case 29 had been concerned in a robbery and was aware that he faced other more serious charges.

From the tabulated results it will be seen that there was no correlation between the presence of nystagmus and nystagmoid jerks with tachycardia, depression of the temperature, or tendon reflexes. It will be seen, however, that, of the 12 cases exhibiting Rombergism, six were associated with nystagmus, five had nystagmoid jerks, and only one (Case 31) was seen without such eye movements. Nine of the cases failed, with their eyes closed, to touch their nose with the right index finger. Of these seven had nystagmus and two nystagmoid jerks. Failure of the index-finger-to-nose test and Rombergism were found together in six cases, four of which had nystagmus and the remaining two nystagmoid jerks.

In the series there were three cases with dilated pupils which did not react to light and one with dilated pupils and sluggish light reaction that had neither nystagmus nor nystagmoid jerks. When these were considered in greater detail two factors became evident—their age and their drinking habits. Case 30, aged 34, travelled several times a week some 90 miles (145 km.) in his car between two branches of his company. When arrested he was found to have in the back of his car a dozen gin bottles containing from a few drachms to about 2 oz. (57 ml.) of gin. Case 31, a commercial traveller aged 35, admitted being a heavy drinker, declaring that his thirst was greater than his purse. Case 32, a master builder aged 35 of good education, admitted to being a regular drinker at his club. Case 33, aged 34, an owner-driver of a ballast truck, was a notorious local alcoholic. Among the remaining seven who did not show either nystagmus or nystagmoid jerks were two who, in spite of having no other eye signs save slight inequality in pupil size, were certified as being under the influence of alcohol. These were Case 37, a 42-year-old man who described himself as a spirit drinker, and Case 39, a general dealer aged 45 whose history supported the impression that he was a chronic alcoholic.

Discussion

If we leave on one side those with nystagmoid jerks and normal reacting pupils (Cases 27, 28, and 29), who in addition to having taken alcohol had been exposed to violence and hence may have been subject to other factors, we can see a definite pattern in the result of the cases. First there are 26 cases in which there was nystagmus or nystagmoid jerks with dilated pupils. All but two of these had absent or sluggish reaction to light. The four cases with dilated pupils and absent or sluggish reaction to light but no involuntary eye movements were young alcoholics in their middle thirties. Finally, among those cases not exhibiting nystagmus, nystagmoid jerks, or dilated and inactive pupils were two older alcoholics who, unlike the others in the group, were under the influence of alcohol.

It seems that in most people the taking of alcohol produces either nystagmus or nystagmoid jerks, and this is related to dilatation of the pupil and in most cases to its absent or sluggish reaction to light. It further seems that in young alcoholics there is some interference with these movements, while in older alcoholics this occurs in addition to a possible suppression of the mechanism leading to dilatation of the pupils. Bender and Brown (1948), while examining patients under intravenous "sodium amytal," reported that in alcoholics, instead of getting the nystagmus or nystagmoid jerks seen in non-alcoholics, there appeared a shimmering nystagmus. They concluded that the continued use of alcohol damaged that part of the nervous system responsible for producing nystagmus in response to

Case No.	Nystagmus	Pupil	Reaction to Light	Reaction to accommodation	Conjunctiva	Romberg's Sign	Finger-to-nose Test	Tendon Reflex			Temperature (°F.)	Pulse
								Biceps	Supinator	Knee		
1	N	Dilated	–	+	S	–	Normal	+	+	+	98·6	100
2	N	,,	–	–	S	–	,,	+	+	+	95·6	104
3	N	,,	–		–	+	Abnormal	–	–	–	97·6	96
4	N	,,	–	–	S	–	,,	+	+	+	97·0	100
5	N	,,	–		S	++	,,	–	–	–	97·4	96
6	N	,,	–	–	S	–	Normal	+	+	+	95·0	88
7	N	,,	–	–	S	+	Abnormal	–	–	+	96·4	120
8	N	,,	–	+	S	+	,,	+	+	+	96·4	120
9	N	,,	–	+	S	–	Normal	+	+	+	97·0	100
10	N	,,	–	–	–	–	,,	–	–	+	96·0	120
11	N	,,	–Sl		–	+	,,	+	+	+	96·6	80
12	N	,,	Sl	–	–	Rigid	Abnormal	–	–	+	95·0	120
13	N	,,	Sl	–	S	–	Normal	?	?	?	97·4	80
14	N	,,	Sl	Sl	S	–	Abnormal	+	+	+	96·6	108
15	N	,,	Sl	–	S	–	Normal	–	–	+	95·0	104
16	N	,,	Sl	–	S	+	,,	+	+	+	97·0	100
17	NJ	,,	–	–		+	,,	+	+	+	96·6	84
18	NJ	,,	–	–	S	+	,,	+	+	+	95·6	104
19	NJ	,,	–	–	S	–	,,	–	–	–	95·0	100
20	NJ	,,	–	–		–	,,	+	+	–	97·0	120
21	NJ	,,	–	–		+	Abnormal	+	+	+	95·8	112
22	NJ	,,	Sl			–	Normal	+	+	+	95·0	120
23	NJ	,,	Sl		S	++	Abnormal	–	–	+	96·2	80
24	NJ	,,	Sl		S	–	Normal	–	–	+	97·0	100
25	NJ	,,	+		S	–	,,	+	+	+	97·2	120
26	NJ	,,	+		S	–	,,	+	+	+	97·0	100
27	NJ	Normal	+		S	–	,,	+	+	+	97·8	82
28	NJ	,,	+	+		–	,,	–	–	–	96·0	80
29	NJ	,,	+			+	,,	–	–	+	97·2	100
30	Nil	Dilated	–		S	–	,,	–	–	–	97·0	120
31	,,	,,	–		S	+	,,	+	+	+	96·0	88
32	,,	,,	–		S	–	,,	+	+	+	96·2	84
33	,,	,,	Sl	–	S	–	,,	+	+	+	96·0	88
34	,,	,,	+	+		–	,,	+	+	+	96·6	116
35	,,	Normal	+	+		–	,,	+	+	+	96·6	120
36	,,	,,	+	+	S	–	,,				97·2	96
37	,,	Unequal	+		S	–	,,	–	–	+	95·6	116
38	,,	Normal	+		S	–	,,	+	+	+	96·0	80
39	,,	Unequal	+			–	,,	–	–	–	98·0	120
40	,,	Normal	–	–		–	,,	+	+	+	97·0	120

N = Nystagmus. NJ = Nystagmoid jerks. S = Suffused. Sl = Sluggish.

the stimulus of sodium amytal. In the present survey it seems that a similar state of affairs may exist in so far as heavy drinking for a limited period damages or interferes with the nystagmoid reaction to alcohol, while long-standing alcoholism leads to non-dilatation of the pupil in addition to the absence of the nystagmoid movements. It is of interest to note at this stage that Rombergism and failure to perform the finger-to-nose test was, with the exception of Case 31, always associated with nystagmoid movement. That exception was the young alcoholic mentioned above.

Conclusion

The taking of alcohol commonly produces a lateral nystagmus or nystagmoid jerks. This phenomenon is associated with dilatation of the pupils and in most instances with their absent or sluggish reaction to light, but bears no relation to tachycardia, to depression of the temperature, or to the loss of tendon reflexes.

Further, the taking of alcohol in large quantities over a period of years seems to suppress the production of this nystagmus and, if continued long enough, interferes with the dilatation of the pupil and its defective reaction to light. Finally, Rombergism and errors of projection do not occur independently of nystagmoid movement unless there is reason to suspect that the latter is inhibited by alcoholism.

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TERRAMYCIN IN THE TREATMENT OF PNEUMONIA IN CHILDREN

BY

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Since the isolation of terramycin from *Streptomyces rimosus* in 1950, it has been prepared in a pure crystalline form which when administered orally is of low toxicity and has a wide range of antibacterial activity.

The effectiveness of terramycin in the treatment of bacterial pneumonia in children has already been reported by King *et al.* (1950), Potterfield and Starkweather (1951), and others in the United States, and by Wolman and Holzel (1952) in England. There is, however, little evidence that this drug is any more effective than or preferable to penicillin and/or sulphonamide therapy, which was recommended for the treatment of pneumonia in preference to chloramphenicol and aureomycin (Medical Research Council, 1951). Eadie *et al.* (1951) also confirmed that penicillin in the treatment of pneumonia was as effective as aureomycin. Therefore a clinical trial of terramycin and a "standard treatment" of penicillin and sulphonamide was carried out from February to April, 1952, at the Royal Belfast Hospital for Sick Children.

Method

A consecutive series of 63 children admitted with a diagnosis of pneumonia was divided alternately into two groups, one for treatment with terramycin and the other for the "standard treatment." Subsequently five children who developed pertussis and three found to have a primary tuberculous infection were rejected: in three others the diagnosis was considered to be bronchitis, and these were excluded from the series, as were two infants so severely ill that the trial was discontinued in favour of additional antibiotics.

In the remaining 50 the diagnosis of pneumonia was a clinical one, using the generally accepted criteria confirmed soon after admission by radiograph in all cases except three in which there was only radiological evidence of bronchitis, but which were included on the definite clinical evidence of changes in medium and smaller bronchioles. A pharyngeal swab was taken on admission and cultured. A total and differential white blood cell count was made as soon as possible. A Mantoux reaction either of strength 1/1,000 or 1/100 solution of old tuberculin was completed, being negative in all except two who had received previous B.C.G. vaccination.

Treatment.—The group treated with terramycin received orally 20 mg. per lb. (44 mg. per kg.) body weight per day in four divided doses. The "standard treatment" group was given 0.5 g. of sulphadimidine orally at four-hourly intervals, and 300,000 units of procaine penicillin G ("distaquaine G") intramuscularly at 12-hourly intervals if over the age of 3 years. If less than 3 years 0.5 g. of sulphadimidine was given immediately and 0.25 g. four-hourly with 150,000 units of procaine penicillin G at 12-hourly intervals. Treatment was continued until the clinical condition was satisfactory and the temperature had been normal for 48 hours.

Comparability.—The various factors of importance which influence the course of pneumonia are compared for the two treatment groups in Table I. The severity of the

TABLE I.—*Comparability of Treatment Groups*

	Terramycin Group	"Standard Treatment" Group
No of Cases	25	25
Male	16	17
Female	9	8
Average age in years	3.2	2.1
Type of pneumonia:		
Lobar	12	13
Broncho	13	12
No of severe cases	6	6
Average duration of illness before admission:		
≤72 hours	8	13
>72 hours	17	12
History of previous chest infection	13	11
Average temperature on admission (° F.)	101.3	102.7

pneumonia was assessed clinically; a severe case was one in which the patient was thought likely to die within 36 hours and required oxygen therapy. The differentiation of bronchopneumonia and lobar pneumonia in children is a difficult one to make. In this series lobar (or segmental) pneumonia was diagnosed when there was clinical and radiological evidence of a localized area of consolidation. Bronchopneumonia was believed to be present when there were generalized signs in medium and finer bronchi and bronchioles, with patchy consolidation clinically and radiologically. Unless such evidence was present the diagnosis was thought to be bronchitis and the case rejected from the series (except for the three instances mentioned above), although it was appreciated that there is little division between a severe bronchitis, bronchiolitis, or an early bronchopneumonia.

Results of Treatment

The effectiveness of treatment was assessed on the duration of fever, the average stay in hospital, the development of complications, and the mortality (Tables II and III). From these results it can be seen that there is no significant difference in the duration of pyrexia or length of stay in hospital for the whole group or for the severely ill cases.

There was one death in the series which occurred in a mongol of 8 months of age who succumbed within three hours of admission.

TABLE II.—*Results of Treatment in the Two Groups*

	Terramycin Group	"Standard Treatment" Group
Average duration of pyrexia for all cases ..	3.1 days	3.0 days
Average period in hospital:		
All cases	10 ,,	9.9 ,,
Severely ill cases	12.2 ,,	11.6 ,,
Mortality	0	1

TABLE III.—*Complications of the Two Treatment Groups*

	Terramycin Group	"Standard Treatment" Group
Thrush infection	4	0
No. of cases staying in hospital longer than 10 days	9	7
Due to delayed pulmonary resolution ..	8	2
,, ,, gastro-enteritis	1	2
,, ,, social reasons	0	2
,, ,, subsequent plastic operation ..	0	1

Complications.—The complications occurring, and an analysis of the causes for children staying in hospital longer than the average period of 10 days, are shown in Table III. It is probably significant that there were eight instances in the terramycin group of delayed pulmonary resolution compared with two in the standard treatment group. A thrush infection of the mouth developed in four of the terramycin group, which emphasizes the risk of this infection during antibiotic therapy, especially with chloramphenicol, aureomycin, and terramycin. It is suggested that when these drugs are given to infants and small children the mouth should be painted with 1% aqueous gentian violet solution daily and the vitamin-B complex added to the diet. There were no other complications during treatment. Terramycin was in fact well tolerated by all patients and did not give rise to anorexia, diarrhoea, or vomiting *per se*.

Discussion

The difficulty in obtaining sputum in children is well known, and during this trial the use of a pharyngeal swab proved unsatisfactory to determine the infecting organism. This may have been partly due to antibiotic therapy before admission, because it was observed that in those cases known to have had some previous therapy no specific infecting organisms were obtained except in the mongol, who received one penicillin injection before admission and was found to have a haemolytic *Staphylococcus aureus* infection which proved fatal.

In eight instances pneumococci were isolated. The culture from the pharyngeal swab was often a mixed one, *Streptococcus viridans* being present in 30, haemolytic streptococci in 12, *Staph. aureus* in 6, and coliforms in 3. As Macaulay (1951) has shown that cold agglutinin tests and staining of swabs of pharyngeal epithelium for cytoplasmic inclusion bodies are unreliable as evidence of a virus infection in pneumonia, no attempt was made to differentiate pneumonia of virus origin.

It was also observed that the white-cell count was of little diagnostic value except to exclude the possibility of pertussis infection, as in 14 patients (28%) the total white blood cell count remained under 10,000 per c.mm.

It is believed that, in view of the comparability of the two groups, there is no evidence from the results of the two treatment groups that terramycin is any more effective than the "standard treatment." In fact there was a greater incidence of delayed pulmonary resolution with terramycin, although the average age in this group was higher and likely to favour a better response. The drug did, however, avoid the unpleasantness of giving injections to children and the possibility of toxic renal or haematological effects of sulphonamide, though none were observed in this series.

From the results obtained in this trial, especially on account of the expense and limited availability of terramycin, it is suggested that penicillin and sulphonamide therapy remains the most satisfactory treatment for bacterial pneumonia in childhood.

Summary

A clinical trial of pneumonia in 50 children, using terramycin or a "standard treatment" of penicillin and sulphonamide, has been made.

The two groups are considered to be comparable and the results of treatment in each group assessed.

It is suggested that penicillin and sulphonamide remains the most satisfactory treatment for pneumonia in childhood.

We wish to thank Professor F. M. B. Allen and staff of the Royal Belfast Hospital for Sick Children for their assistance in this trial, and Professor J. H. Biggart, of the Department of Pathology, Queen's University, Belfast, and Dr. Gladys L. Hobby, of Charles Pfizer and Co. Inc., New York, for making available a supply of terramycin.

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A CASE OF LIPOMA OF THE PAROTID GLAND

BY

REGINALD T. PAYNE, M.D., M.S., F.R.C.S.

Lipomata of the parotid region are very rare. They may occur adjacent to the parotid capsule, inside the capsule, or within the substance of the gland. Occasionally an intracapsular lipoma may be associated with fatty transformation of the gland, and a specimen illustrating this condition is in the museum of St. Bartholomew's Hospital Medical College. The diagnosis of an intracapsular lipoma must always be a matter of difficulty, and confusion with mixed parotid tumours is unavoidable. The softness of a lipoma may suggest an adenolymphoma of the gland or its vicinity.

Case Report

The patient, a woman aged 35, was referred to me by her dental surgeon on account of a swelling in the right cheek. About two years previously, in the summer of 1941, she had had two or three attacks of swelling of the cheek lasting for a few days. Her local dental surgeon thought the right lower wisdom tooth might be the cause. Slight tenderness and swelling in the middle of the right cheek had persisted since the early part of 1942. In March, 1943, the right lower wisdom tooth was extracted, but the swelling remained unchanged. In September, 1943, she consulted a London dental surgeon, who thought the swelling was connected with the right parotid.

When the patient came under observation in September, 1943, the swelling was not increasing in size and there had been no pain since the extraction of the wisdom tooth. The swelling did not alter with meals, and there was no bad taste or dryness of the mouth. Her previous health had been good, apart from a tendency to frequent colds and occasional mild sore throats.

The patient was a very healthy woman. There was a visible fullness over the lower and anterior part of the right parotid gland. Palpation revealed an ovoid swelling 1½ by ½ in. (3.8 by 1.3 cm.), running backwards and downwards

from the centre of the cheek towards the angle of the jaw. The swelling was soft in consistency, its edges were fairly well defined, and there was no fixation to the skin but only slight mobility over the deeper tissues. The parotid duct and orifice were natural, and no other local abnormality could be made out.

The patient was admitted to a private hospital for investigation. A probe passed easily along the right parotid duct. Cannula saliva was profuse in amount; it contained an occasional epithelial cell, but no organisms were present and cultures were sterile. Skiagrams and a sialogram were normal. There was a moderate degree of secondary anaemia.

A diagnosis of a tumour of the parotid gland was made, but there were certain unusual features. First, the tumour was situated further forward and lower than is usually the case with mixed tumours; and, secondly, it was soft in consistency. Both immediate operation and a period of observation were considered. It was eventually decided to give a course of deep *x*-ray treatment and to operate two weeks later. After completion of the treatment the patient's comments were that the tumour had become firmer, a little smaller, more rounded, and that it stood out more. These findings were confirmed on examination. The changes in the physical signs were interpreted as confirmatory evidence that the tumour was of the mixed parotid type. Operation was advised.

Operation.—This was carried out on October 19, 1943, under endotracheal gas, oxygen, and ether. The right parotid region was exposed through the usual curved incision passing from the zygoma downwards, slightly behind the angle of the jaw, and forwards to the anterior border of the masseter. The whole region was very vascular. The tumour was situated in relation to the lower and anterior part of the gland, and about two-thirds of it was within the capsule. In appearance the tumour was lobulated and resembled a lipoma. The anterior part of the tumour went just through the buccinator muscle and was in close contact with the duct, the outer part of which was cut across during removal. Both ends of the duct were probed. The wound in the duct was closed with three fine catgut sutures to the mucosa and three to the adventitia. The whole region was then covered with fascia, and the subcutaneous fat was sutured carefully. The skin was closed with horsehair.

Pathology.—The tumour itself was an irregular mass of fatty tissue, 1¼ in. (3.2 cm.) in diameter, with a lobulated surface, and of rather flattened spherical shape. Histologically it was a simple lipoma.

Post-operative Course

There was a moderate degree of swelling of the whole of the right side of the face after operation. The duct was probed daily and the flow of saliva appeared to be unobstructed. The local swelling started to subside on October 24, when a small haematoma was evacuated from the middle of the wound. Two days later there was a trace of pus at this site, and on November 3 it was thought that a few drops of saliva were coming through the wound. A jaw bandage was applied and the patient was put on fluids. The external wound then healed normally, but by November 8 the saliva from the duct was turbid. Next day all the dressings were removed and the patient was taking ordinary diet. By November 10 there was again a moderate degree of swelling of the right side of the face, but this disappeared after the duct had been probed. This swelling recurred daily, but was always temporarily cured by pasing a probe, which produced a small amount of blood-stained saliva. A few days later the probe was slightly obstructed at about the hilum of the gland. At this stage it was noticed that when the facial swelling was at its worst there was a considerable fluid swelling in the subcutaneous tissues. The patient found that for a few hours after the probing she could empty the swelling by pressure, but after several hours this ceased to be possible. By November 23 the local swelling was getting very tense.

On November 29 the fluid coming along the duct was purulent and blood-stained. On the following day No. 1 catgut was passed along the duct, and was kept in position for 30 hours. During this time the swelling was less tense. Catgut was reinserted on December 1 and remained in for 24 hours. This was changed daily till December 6, when there was a small amount of salivary discharge from the mid-portion of the wound. On the following day the wound was dry, there was little local swelling, and the probe passed easily. After this the condition steadily improved, and the wound remained healed. The patient left hospital on December 12. There was no further trouble in the face, and the scar became almost imperceptible. The patient was seen in April, 1952, and in the intervening period there had been no change in the local condition.

Comment

In the above case the deep *x*-ray treatment was given because of the position and softness of the tumour and the doubts about the exact diagnosis. The subsequent sharper definition and increased firmness after irradiation tended to confirm the diagnosis of a mixed tumour.

The vascularity of the region, the softness of the growth, and the passage of its anterior part through the buccinator muscle made a preliminary and complete separation of the duct impossible. The post-operative troubles were due to the leakage of saliva at the suture line in the duct despite the daily probing. The gradual development of the tense subcutaneous swelling produced complete obstruction of the outflow of saliva during the course of the day. Resolution of the complication followed the use of indwelling catgut which was changed daily. The ultimate result was entirely satisfactory.

Medical Memoranda

A Case of Tick Typhus

Tick typhus is very rarely encountered in Britain and may therefore be forgotten when a differential diagnosis is made. The high fever, toxaemia, indurated "boil," and polymorphonuclear leucocytosis can lead to a diagnosis of pyogenic septicaemia. This is doubly regrettable, as not only is specific treatment denied but the administration of sulphonamides may possibly be harmful. The following case illustrates these points.

Case Report

A woman aged 21, recently arrived from New Zealand via Panama, was admitted to hospital with diarrhoea and vomiting of three days' duration; also a septic boil on the right buttock, for which she had been receiving penicillin and sulphamerazine from her own doctor for the past 24 hours. There was no history of previous illness. Sixteen and fifteen days before admission she had been ashore at Colon and Cristobal respectively. Thirteen days before admission she had been ashore at Curaçao, where she sat on a rough stone wall at dusk wearing shorts. These were the only shore contacts during the previous four weeks. There were no similar illnesses aboard ship. Eight days before admission a boil developed on the right thigh with inguinal adenitis. Five days later headache, vomiting, and diarrhoea began.

On examination there was obvious toxaemia; the temperature was 103° F. (39.4° C.) and pulse 130; the conjunctivae were injected. On the outer aspect of the right thigh was a pustule ¼ in. (1.25 cm.) in diameter with a black necrotic centre, the whole surrounded by an indurated haemorrhagic area 4 in. (10 cm.) in circumference. Nothing else abnormal was found; the spleen was not palpable, and the skin was clear. There was a polymorphonuclear leucocytosis of 24,000, but blood taken for culture at this time proved sterile. Penicillin was given.

Four hours later a definite purplish-red macular rash appeared on the thighs. Tick typhus was now suspected, but it was decided to await the result of agglutination reactions before giving chloramphenicol.

Next day her condition had deteriorated considerably; she was semi-comatose, incontinent, and dehydrated. The rash had spread all over the trunk and proximal parts of the limbs, being haemorrhagic in the flexures. Chloramphenicol, 1 g. four-hourly, was begun, and was fairly well retained, the dose being repeated when necessary. Intravenous fluids were given. After 48 hours, though the patient was still very ill, the rash had faded and the temperature fallen abruptly to subnormal levels. By the fifth day appetite had returned and mentality was normal. Chloramphenicol was discontinued after 22 g. had been given.

The agglutination reactions were as follows:

	OX 2	OX K	OX 19
Day of admission	1/ 50	Nil	Nil
Fourth day	1/250	Nil	1/125
Thirteenth day	1/320	1/ 40	1/ 80
Twenty-first day	1/160	1/ 20	1/ 40

Convalescence was rapid and uneventful, though the eschar took three weeks to heal completely.

COMMENT

The definite eschar, combined with the rise in OX 2 agglutination, strongly suggests a tick-borne infection picked up in Curaçao rather than one of the Rocky Mountain spotted type acquired on the American mainland. The dramatic effect of chloramphenicol is well shown; also the occurrence of a leucocytosis (Machiavello, 1951) rather than the leucopenia described by earlier writers. This case illustrates the advisability of starting specific therapy without awaiting laboratory confirmation of the diagnosis.

My thanks are due to Mr. Whittaker, M.I.L.T., who carried out the pathological investigations; also to Lieut-Colonel H. J. Bensted, Director of the Public Health Laboratories at Colindale, who kindly confirmed the agglutination reactions.

R. F. BUTTERWORTH, M.D.
Ilford Isolation Hospital.
Lately Medical Officer.

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Infective Endocarditis Due to Bact. Faecalis Alcaligenes

While some micro-organisms are obligatory pathogens and always associated with definite illness, others are normally harmless commensals that become pathogenic only in special circumstances and in special sites. Well-known examples of the latter type are *Bact. coli*, harmless in the bowel but sometimes migrating to the renal tract and causing pyelitis, and *Streptococcus viridans*, occurring naturally in the mouth but causing a transient bacteriaemia after dental extraction (Okell and Elliott, 1935) and settling down on deformed or injured heart valves to cause an endocarditis.

Bacterium faecalis alcaligenes (Petruschky) is a normal habitant of the intestinal tract of man, and therefore is likely to be a contaminant of blood and other cultures. On the other hand, it has been blamed for fever of the enteric type (Wilson and Miles, 1945; Strong, 1945; Stitt, Clough, and Branham, 1948). Confirmation of the pathogenicity has been suggested by the agglutination of the organism by the patient's serum up to a dilution of 1:50 (Stitt *et al.*, 1948). All intestinal organisms may on occasion pass from the lumen of the bowel into the blood stream, where they are destroyed. It is, however, possible to imagine a transient bowel bacteriaemia with the organisms settling on a damaged heart valve just as the streptococci from teeth have been shown to do. This seems to have happened in the following case.

CASE REPORT

A married woman aged 54 had had heart disease in childhood arising from previous rheumatic fever. She had also had pneumonia three times, at the ages of 10, 49, and 52. Since 1943 she had had diabetes, controlled by diet, 20 units soluble insulin in the morning, and 20 units P.Z.I in the evening. She had a particularly severe attack of subtertian malaria in May, 1950.

On July 5, 1950, she had a sudden attack of nausea and vomiting, followed by continued irregular fever, 100–102° F. (37.8–38.9° C.), with nausea and occasional shivering. Her blood was free of malaria parasites, and antimalarial treatment did not help her. After a fortnight she was admitted to hospital, pale, ill, and tired-looking. There were bruises on her arms at the site of the insulin injections.

Examination showed throat not inflamed, no enlarged glands; pulse rapid, 110 per minute; heart enlarged, apex 4½ in. (11.4 cm.) out in the sixth space; mitral systolic murmur not conducted out; ringing accentuated second sound along left sternal border. In the aortic area there were a slight thrill, a harsh noisy systolic murmur conducted up into the neck, and on leaning forward a diastolic murmur. Blood pressure, 118/90 mm. Hg, showed low pulse pressure. There were moist rales at both lung bases. There was generalized abdominal tenderness, but the liver was not palpable. There was no finger-clubbing.

A blood count showed: Hb, 66%; erythrocytes, 3,600,000; leucocytes, 13,800 (81% polymorphs). Blood slide showed no malaria parasites. Urine contained a trace of albumin.

The fever, leucocytosis, and severe toxaemia resembling a septicaemia in a person who gave evidence of valvular disease suggested that the diagnosis must be bacterial endocarditis; blood cultures were accordingly taken.

Bacteriology.—On July 20 two blood cultures were taken, and both yielded a pure growth of a Gram-negative vibrio-like organism. The organism failed to ferment lactose, glucose, mannite, saccharose, and dulcite. It failed to form indole and was actively motile. Litmus milk was rendered strongly alkaline. It therefore possessed the characters of *Bact. faecalis alcaligenes*. The patient's serum agglutinated the H suspension of the isolated organism to a titre of 1 in 2,560. No agglutination occurred with the O suspension. Six normal sera were set up as controls and no agglutination took place.

Progress.—July 23: No clinical improvement after three days on penicillin, 600,000 units twice daily. Blood culture positive. July 26: Chloramphenicol, 3 g. followed by 0.25 g. four-hourly, started. Blood culture positive. July 31: Condition worse, temperature swinging to 104° F. (40° C.), liver enlarged and tender. August 1: Blood culture negative. August 5: No improvement. Streptomycin, 1 g. daily, and sulphadiazine, 1 g. four-hourly, begun. August 10: Temperature almost normal, blood culture sterile, sulphadiazine stopped. August 15: Temperature still normal, but general condition deteriorating. August 17: Blood culture sterile. August 23: Blood culture positive, leucocytes 24,000 per c.mm. (polymorphs 93%). August 26: Death.

Necropsy.—Permission was granted for only a limited and hurried examination. The heart showed excess fluid in the pericardial sac, and both ventricles were enlarged, especially the left. The aortic valve had lost its structure, and consisted of an opening about 5 mm. in diameter through warty vegetations growing on both sides of the septum. The mitral valve was normal. There were no infarcts in the kidneys or spleen. *Bact. faecalis alcaligenes* was isolated in pure culture from the spleen, but the pericardial fluid was sterile.

Our thanks are due to the Director of Medical Services, Tanganyika, for permission to publish.

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C. MARSHALL, F.I.M.L.T.

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Reviews

MEDICINE IN WAR

Medical History of the Second World War: Medicine and Pathology. Edited by V Zachary Cope, F.R.C.S., with a General Preface by Sir Arthur MacNalty. (Pp. 561. £2 10s.) London: H.M. Stationery Office. 1952.

This is the first of the 18 volumes which will describe the medical history of the second world war. It incorporates the experience of both the Fighting and the Civilian Services, and is the first of two volumes which will record the clinical problems common to both. It is interesting to note that the book makes reference to 22 official medical histories of previous wars, which gives some idea of the background of a subject which is of sufficient importance to justify a section of the Royal Society of Medicine.

The planning of such a vast work, covering the medical problems of the whole world, demands critical selection; its compilation calls for drastic editing. The chronicle must, by definition, be historical, and it must necessarily pick out the highlights in relation to special war problems. Moreover, if its value is not to be limited to historians and warriors, and if its lessons are to be turned to practical use in general medicine, it must have an extensive index. The first volume fulfils all these criteria. The accounts are consistently historical and the index sufficiently comprehensive. The thirty-three chapters, which begin with general medicine, include discussion of manpower-wasting diseases, such as dyspepsia, heart disease, rheumatic diseases, and psychiatric and dermatological disorders; infections, such as hepatitis and allied conditions, smallpox, the typhus fevers, venereal diseases, cerebrospinal fever, tetanus, and diphtheria; and the control of infection by hygienic measures in hospitals and by specific means as with penicillin. Some of the most interesting chapters are on major difficulties, such as the "Results of Exposure After Shipwreck and the Like" and "The Hazards of Toxic Gases in Warships"; others are thumb-nail sketches of a particular *ad hoc* problem, such as Bornholm disease and leptospirosis. It is indeed difficult to pick any section of the book for critical analysis, since the scope of the whole is so wide and the work itself is largely a summary of what will appear in greater detail in subsequent volumes.

It is abundantly clear that the efficiency of the medical services in the second world war far transcended that of medical services in all other wars, mainly because of technical advances which led to an enormous reduction in the waste of man-power and because of advances which allowed disease to be prevented before it had become rampant. In some theatres of war there is little doubt that the D.D.M.S. was sometimes more important than the G.S.O. 1.

The authors and Mr. Zachary Cope, the editor, are to be congratulated on the production of this book.

LIONEL WHITBY.

THE NEW MARTINDALE

The Extra Pharmacopoeia (Martindale). Volume 1. 23rd edition, 1952. (Pp. 1,352. £2 15s.) London: Pharmaceutical Press.

The reviewer's cliché that "no bookshelf is complete without it" can seldom be made with more justification than in the case of "Martindale." Seventy years ago, when its 312 pages were first reviewed, it was doubtless referred to as "this slim volume." No more inappropriate description could be found for the 23rd edition, containing 1,352 pages packed with useful, accurate, and often singular information for the doctor and the pharmacist. The new edition maintains the high standard which we have become accustomed to expect from the publications of the Pharmaceutical Society.

The arrangement of the edition perpetuates the "planned inconsistency" of its predecessors, the underlying motive being to give maximum value to the user. Nevertheless there is a welcome trend towards a more pharmacological grouping. For example, sympathomimetic drugs are placed under ephedrine, and anticonvulsants under phenytoin sodium. Medical readers would welcome an extension of this tendency so that strophanthus and ouabain might appear with digitalis, and so forth. New special sections have been added to include antibiotics, ligatures, and sutures. The difficulty is apparent here and there of keeping any large work concerned with modern therapeutics up to date as it goes through the press. Thus it is improbable that had the section on chloramphenicol been written to-day the drug would have been referred to as "relatively non-toxic." A good balance has been maintained between the space devoted to the newer and older drugs. Perhaps even more of the latter might have been allowed to sink into the obscurity of the smallest type, which can be read by middle-aged people only with the aid of a strong magnifying glass. Some Latin titles such as "cerevisiae fermentum" may give difficulty to medical readers who have not had the advantage of an education in the humanities, and even "hepar" may bewilder the modern medical student despite his careful selection. The index shows nearly 200 entries under the heading unguentum, which provokes solemn dermatological reflections. It is less surprising that nearly 50 pages are devoted to penicillin when it is remembered that 63 billion units of this substance were made in Britain last year. Almost 25% of the type space of the book is devoted to 4,000 abstracts from the literature, which are of necessity dispensed in ingeniously compact capsules. That a high proportion of these are up to date is shown by the statement in the preface that "nearly three-quarters of them are new to the book"—that is to say, later than 1941.

A study of this work leaves one astounded at the industry and ability of the editors, whose names were discovered only after a prolonged search, and with the aid of a magnifying glass, on p. xvii of the preface—Mr. T. C. Denston and Mr. K. R. Capper.

D. M. DUNLOP.

THE ENZYMES

The Enzymes: Chemistry and Mechanism of Action. Edited by James B. Sumner and Karl Myrbäck. Volume 2, Part 2. (Pp. 649. $4.) New York: Academie Press Inc. 1952.

This second part of Volume 2 completes the encyclopaedic work on the enzymes, the earlier parts of which have already been reviewed. As before, each chapter has been prepared by an expert on the subject under consideration, and the present volume includes those aspects of the subject which have not fitted easily into any of the previous parts. The first chapter, on "Bacterial Fermentation," by S. R. Elsden, of the University of Sheffield, is a remarkable feat of compression, including in a delightfully concise way much material in its 52 pages. Then follow articles on "Enzymes in Detoxication" by F. Bernheim, "Urea Synthesis" by J. A. Krebs, "Peptide Bond Synthesis" and "Enzymatic Synthesis of Glutamine" by P. P. Cohen, "Synthesis of Acetylcholine: Choline Acetylase" by Klas-Bertil Augustinsson, "Oxidative Assimilation by Microorganisms" by C. E. Clifton, "Enzymatic Mechanisms of Carbon Dioxide Fixation" by Severo Ochoa, "Carbohydrate–Fat Conversion" by F. L. Breusch, "Photosynthesis in Green Plants" by Walter E. Loomis, "Bacterial Photosyntheses" by C. B. Van Niel, "Nitrogen Assimilation" by A. I. Virtanen and Niilo Rautanen, "Tumor Enzymology" by J. P. Greenstein and Alton Meister, and finally "Enzyme Technology" by A. F. Langlykke, C. V. Smythe, and D. Perlman. The last chapter is a long one, but obviously cannot survey in detail the whole field of industrial or commercial application of enzymic processes. Nevertheless an unusually interesting account is given of processes which are not normally included in an academic work on enzymes.

The index with this part includes that for Part 1 of Volume 2 and includes both an author and a subject index. It is perhaps disappointing that an index covering both volumes could not have been included also at this stage.

With the completion of this extensive and expensive work one has the opportunity to survey the results as a whole. It appears to be a useful review which libraries will need on their shelves and which workers in the field of enzymes will use for reference from time to time. No doubt interested workers and students will read chapters, but it is perhaps unlikely that anybody will ever read the four parts from cover to cover. It is clearly not meant for this, and as a work of reference it performs a very valuable function, though necessarily, with the present rate of development of the subject of biochemistry, any comprehensive work will soon be out of date.

F. G. Young.

RADIOGRAPHIC ANATOMY

An Atlas of Normal Radiographic Anatomy. By Professor Isadore Meschan, M.D., with the assistance of R. M. F. Farrer-Meschan, M.B., B.S.(Melbourne). (Pp. 593; 1,044 illustrations on 362 figures. £3 15s.) Philadelphia and London: W. B. Saunders Company. 1951.

This volume is intended to show how details of normal human anatomy can be demonstrated or clarified by radiology. It begins with a chapter on the nature and production of *x*-rays, on their use in obtaining visual or photographic projections, on the nature of geometrical projection, and on the problems this presents. The authors discuss in great detail the application of these principles to the study of bony structures, and give precise instructions for radiography of all parts of the skeleton in various positions. An admirable series of radiographs of the forearm and wrist, with illustrative diagrams, shows the complex changes involved very clearly.

Modern methods of radiography of the central nervous system are fully described and illustrated by positional drawings, actual radiographs, and explanatory diagrams. The various positions required for ventriculography are sketched and the results illustrated. The anatomy of the spinal column and the relative movements of the vertebrae are ingeniously examined. The book includes a full discussion of radiography of the chest, both directly and with the use of contrast media. There are well-illustrated accounts of bronchography and of the difficult problem of cardiography with opaque media. The great vessels are demonstrated in remarkable radiographs with admirable diagrams. In the accounts of the gastro-intestinal and urogenital tracts all the most modern methods of examination by *x*-rays are precisely described and fully illustrated.

The whole volume is a masterpiece of ingenuity both in actual radiography and in the explanatory diagrams by which the methods and results are profusely illustrated. It should appeal to all who wish to understand human anatomy, whether to the anatomist whose interest is in the normal or to the surgeon who tries to unravel the abnormal. To those who intend to devote themselves to diagnostic radiography it will be invaluable.

Henry Souttar.

PSYCHO-ANALYTIC TEXTBOOK

General Theory of Neuroses: Twenty-two lectures on the Biology, Psychoanalysis, and Psychohygiene of Psychosomatic Disorders. By Professor Rudolf Brun, M.D. (Pp. 469. £3 10s.) New York: International Universities Press, Inc. London: George Allen and Unwin. 1952.

It is refreshing to come across a psychiatric textbook that can be recommended to both student and practitioner without any serious reservation. The trouble with most books on psychiatry is that, even though they may inform the reader of the most up-to-date neuro-psychiatric methods of diagnosis or treatment, they lack that prerequisite of a good textbook on mental disorder—namely, a comprehensible and organized theory of mind.

Dr. Brun, professor of neurology and neuro-biology at the University of Zurich, is also well versed in the theory and practice of psycho-analysis and builds his presentation on a sound psycho-biological basis. Regarded as a textbook, his *General Theory of Neuroses*, now in its second German edition, of which this is the first English translation, challenges comparison with Fenichel's monumental *Psychoanalytical Theory of the Neuroses* and emerges from the contest with flying colours. For whereas Fenichel's work is a storehouse of theoretical reference, it lacks clinical perspective. Dr. Brun's book gives ample evidence of wide clinical experience and, being based on a psychology-in-depth, provides a satisfactory classification and correlation of various neuroses, using that term in its widest sense. Of special value is his long and illuminating discussion of organic factors in neurosis formation, of the "actual or vegetative" neuroses, and of the relation between psychosomatic states and the psychoneuroses. This section might be read with advantage by both neurologists and psychiatrists. Indeed, of the 21 lectures comprising the book, one only, on the character neuroses, falls below the consistently high standard maintained by the author; it is scarcely just to psychoanalytical characterology to include as representative the opinions of Wilhelm Reich. This minor criticism apart, the book is an outstanding achievement to be read by expert and tyro alike.

Edward Glover.

AFTER LEUCOTOMY

Studies in Lobotomy. Edited by Milton Greenblatt, M.D., Robert Arnot, M.D., and Harry C. Solomon, M.D. (Pp. 495. 54 illustrations. £3 3s.) London: William Heinemann Medical Books. 1951.

Personality and the Frontal Lobes. By Asenath Petrie. (Pp. 188. £1 1s.) London: Routledge and Kegan Paul. 1952.

Both these works are attempts to find some rhyme and reason in the results that are produced by leucotomy, the first coming from the Boston Psychopathic Hospital, the second from the department of psychiatry at St. George's Hospital, London. In each case the mode and the scale of the work reflect the country of origin.

No fewer than 30 collaborators took part in the American survey, which covers the after-history of 205 lobotomized patients, of whom the majority were schizophrenics. It was, however, the other diagnostic groups, the psychoneurotics, the involutionals, and the affective psychotics, who provided the best results. Almost every possible change was investigated: the cerebrospinal fluid, autonomic responses, E.E.G., psychology, sex behaviour, and sociology. In all these fields something has been learnt. The interesting but discouraging fact emerges, in this as in other studies, that there is extremely little correlation between the change in any easily measured function, such as the E.E.G. or a psychological test, and clinical improvement.

Mrs. Petrie's study is by herself alone. Twenty-seven patients, mostly suffering from obsessional neurosis or depressive disorders (a prognostically favourable group, of which only one was actually worse after operation), were tested before operation, and again three and nine months afterwards, by a very wide battery of psychological tests. These were of three different types—tests of "neuroticism," tests of introversion-extraversion, and tests of intellectual functions. On the whole the patients tended to become less "neurotic," less introverted, and less efficient at intellectual tests. Most of the individual sub-tests gave non-significant results; and it may well be that future workers along this line will feel that only those of Mrs. Petrie's tests which gave significant results will be worth trying out again. In this way she has probably provided a useful addition to our knowledge.

Eliot Slater.

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TUBERCULOSIS IN A MINING VALLEY

Members of the Pneumoconiosis Research Unit of the Medical Research Council have suggested that the disabling form of pneumoconiosis known as progressive massive fibrosis is a tuberculous lesion modified by the presence of coal dust. It is not possible to test this theory in the laboratory, and therefore the unit has begun a large epidemiological experiment in association with the Welsh Regional Hospital Board. The object of the experiment is to identify and render innocuous every source of tubercle bacilli in a Welsh mining valley, the Little Rhondda, and to see if there is subsequently a fall in the incidence of progressive massive fibrosis in miners known already to have radiological signs of simple pneumoconiosis. In the opening pages of this issue Drs. A. L. Cochrane, J. Glyn Cox, and T. F. Jarman describe the first stage of this investigation—the attempt to identify and render harmless all sources of tuberculous infection in the valley. Such a task has not previously been seriously attempted in this country—certainly not in a community of some 20,000 adults. The detailed problems of organization and the enormous amount of painstaking work involved in examining radiologically 90% of the adult members of the community are shown in the report, which should be studied in detail by others contemplating a similar task. In a survey of this kind the good will of the public must be secured, and the careful groundwork of the Rhondda Fach investigators was remarkably successful.

The results so far reported are of great interest to all concerned with tuberculosis. At first sight it might seem that what has been completed is just another mass radiography survey of a specialized type; but in fact it is much more—an attempt to assess the total number of persons with tuberculosis in the selected community at the time of survey (the winter of 1950–1). Among the women aged 15 years and over, 15.5 per 1,000 examined were recorded as having active or quiescent tuberculosis. Of the young women aged 20–24 years rather more than 5% were found to be in need of treatment or supervision for tuberculosis. For the males of this community a strictly comparable figure cannot be given, since so many of them are miners with signs of simple pneumoconiosis or progressive massive fibrosis the nature of which the experiment is designed to elucidate. The tuberculosis mortality rates for women in the Rhondda Urban District are appreciably higher than those for England and Wales taken as a whole, but they are probably no higher than in many industrial towns. The writers of the report show that the age distribution of positive reactors to tuberculin among the children of the Little Rhondda is very similar to the age distribution found for urban districts of England and Wales as a whole.[1] It seems probable, therefore, that the amount of tuberculosis in the Little Rhondda is not very different from that in many other urban communities at the present time.

This survey also shows the hidden danger of unknown sources of infection. Of 68 women with positive sputum, 22 were previously unknown; and of 54 men with positive sputum, 15 were previously unknown. Thus for both sexes combined no fewer than 30% of those with positive sputum were not previously known to be suffering from tuberculosis. Of all the patients with active disease 40% were previously unknown. It would seem not unreasonable to suppose from this that in Britain as a whole a large proportion—perhaps 25%—of those with infectious disease are not known and are not under any form of supervision or treatment. The need for highly efficient case-finding services is thus obvious, especially in the light of the increasingly effective forms of treatment that can now be offered.

In order to treat the patients whose disease was discovered during this survey the Welsh Regional Hospital Board set aside 54 beds in a local hospital, and it is believed that the number of cases of infectious pulmonary tuberculosis in the Little Rhondda has been reduced by 60%. The infectious patients still in the valley are under frequent supervision by a health visitor, and it is hoped in this way to reduce their danger to others to a minimum.

The results of the survey also shed some light on the epidemiology of tuberculosis in recent years. Drolet and Lowell[2] have recently asserted that mass radiography has no effect on notification rates, since all the cases found would become known sooner or later. The answer to this lies in the notification register of the Little Rhondda during the period of the survey: it must have shown a notable increase, without any increase in the real prevalence of the disease in the community. Similarly the introduction of mass radiography, together with the ever-increasing numbers of films taken in chest clinics and hospitals,

[1] *Lancet*, 1952, **1**, 775.
[2] *Dis. Chest*, 1952, **21**, 527.

may be the explanation of the post-war rise of the notification rate in this country. There is now evidence that the size of the pool of unknown cases was, even in 1950 at the end of the rise, still large enough to account for the increase in notifications, which was of the order of 25% on pre-war figures. The next step of the Rhondda Fach investigation—a similar survey of the valley in 1953—should add yet more to our knowledge of the epidemiology of tuberculosis, even if the primary object of the investigation—an alteration in the attack rate of progressive massive fibrosis—is not achieved. It is to be hoped that the study will not finish in 1953: at least one further survey should be undertaken after a similar interval. Surely, too, a similar intensive study of tuberculosis in the whole of a non-mining community is urgently required.

TREATMENT OF BRAIN ABSCESS

Infections of the meninges and intracranial venous sinuses were almost invariably fatal before the days of treatment with sulphonamides or antibiotics. Recovery from a brain abscess was dependent upon circumstances favouring encapsulation of the pus and thus making possible its subsequent removal by methods designed to ensure that contamination of the subarachnoid space or ventricles did not occur. The advent of the new drugs has made possible the cure of pyogenic meningitis and of certain cases of intracranial thrombophlebitis. In infections of the brain tissue itself the drugs assist localization of the inflammatory process and greatly reduce the risks of spread of organisms—whether this be spontaneous or the result of surgery—to the cerebrospinal-fluid spaces. In these infections of the brain, however, life is threatened not only by the infection but by the space-occupying lesion in the cranium—a lesion marked by the presence of pus, oedema, and vascular congestion. Only when the infection is localized and pus encapsulated is surgery likely to benefit the patient. During the period from the onset of the cerebral infection to its eventual surgical treatment chemotherapy, measures designed to reduce intracranial pressure, and careful nursing are of the greatest importance; operation is essentially intended to remove from the brain the inflammatory products of a localized infection. This must be borne in mind in considering the relative merits of the different forms of surgical treatment of brain abscess. The efficiency with which the tissues have localized the infection has more bearing on the outcome than has the type of operation chosen, and the different surgical techniques are strictly comparable only when applied in identical groups of cases.

In an important paper Jooma, Pennybacker, and Tutton[1] have compared the results of different surgical techniques in a series of 295 cases of brain abscess treated in the neurosurgical centres at Edinburgh, Manchester, and Oxford over a period of 25 years. The mortality for the whole series was 40% (53% before penicillin therapy was available and 27% since). Of 95 patients treated by aspiration 58 died (mortality 61%); of 89 treated by drainage 45 died (mortality 50%); and of 111 treated by excision 15 died (mortality 13%). As the authors point out, the figures are not comparable in that the desperately ill patients were treated by tapping; when excision was carried out the patient was often well (sometimes as a result of repeated tapping), and the operation was performed to minimize the risk of relapse or to speed a cure which could have been effected by repeated aspiration. The authors found, as would be expected, that the tapping of an abscess more often decreased a pre-operative disturbance of function than did excision, which may, especially if carried out in the acute stage, add to the neurological signs. On the other hand, the recurrence rate after aspiration or drainage is 8%, whereas there was no case of recurrence in the group of patients treated by excision. The incidence of epilepsy in the patients with cerebral abscess who survived operation was 47%. This considerable risk of post-operative epilepsy did not appear to be influenced by the method of treatment except with frontal lobe abscesses, when epilepsy was much more common after tapping than after excision of the abscess capsule. The authors consider that the results of their investigation slightly favour excision as the best method of treatment.

Every case of intracranial infection must be treated individually on its merits, and nothing will be gained by attempting to apply one form of surgery to all cases. While the older methods, such as marsupialization, which were designed to minimize the risks of infection of the meninges, can be dispensed with, each of the other methods has its place. Tapping the abscess will continue to save some desperately ill patients—who can undergo the operation for excision later—and will sometimes cure the abscess. Drainage will remain the method of choice for abscesses caused by penetrating cerebral wounds—particularly when they are situated in an important functional area or develop in the early weeks after wounding. Excision of the abscess capsule will be required when tapping fails, and also when the lesion is thick walled and large, though it may contain only a few millilitres of pus. It will also be the operation of choice when a

[1] *J. Neurol. Neurosurg. Psychiat.*, 1951, 14, 308.

chronic abscess is exposed under the mistaken diagnosis of neoplasm. At times when multiple abscesses are present, life may be saved by a block excision of the affected region.

CONTROL OF BONE LENGTH

Irregularities in leg length, by causing marked physical deformity and an awkward gait, have excited surgical interest for centuries. It was not until Rizzoli,[1 2] of Bologna, in 1847 resected part of a femoral shaft that the surgical adjustment of leg length was first definitely undertaken. There are now three methods of adjusting inequalities: leg lengthening, leg shortening, and epiphysial arrest. Codivilla,[3] Rizzoli's successor, was the first to undertake leg lengthening, and the work of Putti,[4] Abbott,[5] and Allan[6 7] have developed its technical efficiency, so that a 2-in. (5-cm.) increase in length may be obtained in the femur and a 3-in. (7.5-cm.) increase in the tibia and fibula without difficulty, and much greater lengths have been gained. Two hindrances are often encountered in limb lengthening—defective muscular control and a poor state of nutrition. While these may be insuperable objections to the surgeon, an attack on the sound limb may well be equally objectionable to the patient. He not only objects to the loss of stature but fears to risk his one sound limb. Limb shortening, however, has much to recommend it, being surgically easier and accompanied by fewer complications. It is an operation which permits an accurate and controlled single adjustment of bone length.

Theoretically, epiphysial arrest is the ideal procedure in the growing patient. This was first suggested by Phemister[8] in 1933. Experience has shown the desirability of a more thorough destruction of the epiphysis than he thought would be necessary.[9] Elaborate methods have been developed to calculate limb growth,[10] but since growth is dependent on a complex interplay of factors no assessment can certainly avoid error, and in practice simple calculations suffice based on the known fact that the femoral epiphysis adds ⅜ in. (0.9 cm.) per annum to leg length and the tibial epiphysis ¼ in. (0.6 cm.). Epiphysial blocking puts a stop to further growth, and, while very few cases of overshortening have been reported, the discovery by Blount and Clarke[11] that epiphysial growth might be arrested by stapling, and that on withdrawal of the staples growth would recommence, removed even this slight risk and was therefore greeted with enthusiasm. A further report by Blount and Zeier[12] amplifies their previous experience. Staples may be left in place for two years, and growth will be resumed at a temporarily increased rate on their removal. Epiphysial closure occurs earlier on the stapled side. Some technical details of the strength, size, and number of staples to be used have been altered as a result of experience. Insufficient stapling is accompanied by bending and often extrusion of the staples. A lower age limit of 8 years has now been decided on. Generous acknowledgment is made to Lane's[13] account, published in 1914, of the effects on the epiphysis of stapling carried out on a child in 1905. The growth of the limb was disturbed, but Lane never drew the inference that such a method might be used to control growth at will. Blount's method is still under trial, but there are high hopes of its efficiency and of its suitability for correcting limb inequality in growing children. The only remaining method of altering bone length, that of the local stimulation of bone growth, is being explored but at present appears to be clinically impracticable.

1 *Wien. med. Wschr.*, 1869, **19**, 1238.
2 *Mem. Accad. Sci. Inst. Bologna*, 1871, **3s**, **1**, 485.
3 *Amer. J. orthop. Surg.*, 1905, **2**, 353.
4 *J. Amer. med. Ass.*, 1921, **77**, 934.
5 *Ann. Surg.*, 1939, **110**, 961.
6 *British Medical Journal*, 1951, **1**, 218.
7 *J. Bone Jt Surg.*, 1948, **30B**, 490.
8 Ibid., 1933, **15**, 1.
9 Eyre-Brook, A. L., *British Medical Journal*, 1951, **1**, 222.
10 Green, W. T., and Anderson, M. *J. Bone Jt Surg.*, 1947, **29**, 659.
11 Ibid., 1949, **31A**, 464.
12 *J. Amer. med. Ass.*, 1952, **148**, 451.
13 *The Operative Treatment of Fractures*, 1914, 2nd ed., London, p. 133.

NEW CLASSIFICATION

The Medical Practices Committee's revised classification of practice areas, together with an explanatory preamble, appears in the *Supplement* this week. The committee, as well as executive councils and local medical committees, are to be congratulated on the speed with which they have carried out a complicated task—the first essential step in the scheme for the new distribution of the central pool. This early publication should give time for doctors to plan between now and next April, when the new scheme begins. It will also give time for executive councils and local medical committees to review their classification, and this should smooth out any local dissatisfactions in an amicable way.

"Restricted" areas are those in which the number of doctors is considered adequate, and normally applications to start new practices will not be granted. In "doubtful" areas automatic acceptance of an application to practise cannot be assumed and will be considered in the light of prevailing circumstances. Admission to the medical list will be automatic in an area which is classified as "designated" at the time of application. The initial practice allowance may be claimed only in respect of new practices in designated areas. These allowances will be a first charge on the central pool and not, as with the basic salary, on the local pool. In Scotland the availability of the initial practice allowance will be determined by the Scottish Medical Practices Committee on the merits of each individual application and not by previous designation of areas.

The following groups of practitioners will be eligible to apply for an initial practice allowance: new entrants to the Service who are setting up in single-handed practice; practitioners filling vacancies in small single-handed practices where the remuneration from the practice is below a specified level; and practitioners who, when the scheme comes into operation, are in receipt of fixed annual payments. To qualify for an initial practice allowance a practitioner should have been in general practice for not less than two years or have been registered as a medical practitioner for not less than four years. Practitioners who, when the

scheme begins, and whatever the new classification of their practice area, have been in receipt of a fixed annual payment for less than three years will receive initial practice allowances for the appropriate balance of the three-year period, subject to standard conditions governing the minimum size of list to be attained at the end of each year, and the maxima which are to be applied to gross remuneration.

Some designated areas are specially marked—namely, where the position is finely balanced and the admission of only one or two doctors may result in reclassification. It is to be hoped that in the interests of stability these areas will not be subject to frequent alterations.

JOBS FOR BIOLOGISTS

There was perturbation in schools and universities when in 1950 the Ministry of Labour[1] reported that there was likely to be, during the next five years, a considerable over-production of biologists, and many attempts were made to show that the subcommittee which was responsible for this report had neglected available data or drawn false conclusions from those which it had used. It was therefore appropriate that the Institute of Biology should hold a symposium on "Biology as a Career," and this discussion took place at the University of Birmingham earlier this month. The conclusion which most people drew from the conference was probably that the situation is at least not quite so black as it has been painted. Mr. B. G. Meara, of the Technical and Scientific Register of the Ministry of Labour, quoted figures of recent recruitment to the scientific officer class of the Civil Service which suggested that there is as good a market for honours graduates in botany, zoology, and physiology as there is for those in chemistry. On the other hand, there seem to be fewer jobs for the third class and pass biologist than for the physicist and chemist of comparable qualifications. This was also the view of Sir William Slater, secretary of the Agricultural Research Council, who, speaking on "Agricultural research and the career it offers," said that not only are there relatively few vacancies in the experimental officer class but that many directors of research institutes prefer to recruit for this grade direct from the schools. On the other hand, Professor J. F. Danielli, of King's College, London, as well as speakers in the subsequent discussion, deplored the fact that in many schools pupils are advised to do biology because they are no good at physics or mathematics, which agrees with the fact that proportionately more students take pass degrees in biology than in physics and chemistry.

The trouble seems to be not that there are too many biologists, but there are not enough good ones and that they have not had the best training for the jobs available. Sir William Slater, Professor Danielli, and Mr. H. J. Bunker all spoke of the great need for biologists with a good knowledge of chemistry, and it seemed to be agreed that the foundations for this must be laid at school. By contrast, there are medical schools which prefer their students to have done no science before they come up, and it is to be doubted whether they realize how difficult it is, with the vast and expanding content of the basic sciences, for anyone to get a good grasp of them unless their study is begun early. Mr. W. B. Yapp, of Birmingham University, thought that the quality of biology teaching in schools would improve only if the university departments planned their courses with the realization that many of their students would later teach, and if they ceased discouraging the goods ones from doing so. Sir Harold Himsworth, secretary of the Medical Research Council, after emphasizing the importance of co-operation in medical research—where, for example in radiotherapy, clinicians, physicists, biologists, and chemists must work as equal partners in a team—said that the Council had found that few graduates were suitably equipped for its work, so that it had started a scheme of training scholarships; and there were also fellowships to enable medically qualified men to return to biology after a few years' hospital experience. Other speakers mentioned the more general qualities of character needed for success in the less sheltered life of the Empire and in industry. A university cannot do more than encourage these qualities where it finds them, but experience shows that biologists, perhaps because the problems with which they have to deal have many variables, often take easily to administration. If there is an over-production of biologists, the solution would seem to be that more of them should go on to administration and management, both in the Civil Service and in industry.

[1] *Present and Future Supply and Demand for Persons with Professional Qualifications in Biology, Agriculture and Related Sciences*, 1950, H.M.S.O., London.

INFECTED ANAESTHETIC APPARATUS

The closed-circuit anaesthetic apparatus, which includes a canister of caustic soda-lime, is usually beyond suspicion as a means of transferring infection from one patient to another; but a recent article by Dr. J. M. Joseph, of Toledo, Ohio, indicates that bacteria may sometimes grow in it.[1] His investigation was prompted by an outbreak of follicular tonsillitis among patients who had been anaesthetized by the closed-circuit technique. He found that organisms could be recovered from the tubes and rebreathing bags of apparatus which had been rinsed with plain water after use, or which had not been used for several days, and he believes that the anaesthetic itself increases the danger of infection. Joseph suggested that the tubing should be washed with an antiseptic solution, and the rebreathing bag cleaned frequently to prevent the accumulation of debris which encourages bacterial growth.

In Britain it is common practice to boil the rubber parts of the closed or semi-closed apparatus only at intervals, unless they have been used for a patient known to harbour pulmonary tuberculosis or another open infection. Facepieces are usually sterilized by washing with soap and water, and endotracheal tubes by immersion in 1 : 2,000 biniodide of mercury, fol-

[1] *J. Amer. med. Ass.*, 1952, **148**, 1196.
[2] Hewer, C. L., *Recent Advances in Anaesthesia and Analgesia*, 6th ed., 1948, p. 304, London.

lowed by rinsing. Carbolic or cresol solutions are not favoured for facepieces, since they may be absorbed by the rubber and inflict fairly severe burns. Facepieces used for patients with tuberculosis have remained infected after washing in water,[2] and these should be treated with an antiseptic and rinsed before use. The possibility that any patient might be suffering from undiagnosed tuberculosis is good enough reason for treating all facepieces in a similar way, and it would seem worth while to sterilize the inside of the closed-circuit apparatus when practicable. But cases of cross-infection through anaesthetic apparatus are rare, and despite Joseph's paper it is unreasonable to add this to the recognized hazards of anaesthesia.

INJECTIONS INTO ARTERIES

Drugs may be injected into arteries for diagnosis or for treatment. Early antiseptics and antisera were sometimes given in this way in the belief that the high concentration achieved would outweigh the disadvantage of a short time of contact with infected tissues, and at one time it was popular on the Continent to inject sulphonamides or penicillin into an artery. It is now, however, agreed that the more prolonged effect of antibacterial agents administered by the ordinary methods is of greater advantage, and the arterial injection has fallen into disuse. The injection of vasodilator drugs is somewhat different, because no drug has yet been invented which will give prolonged and full vasodilatation without serious side-effects due to toxicity or to circulatory changes such as hypotension. It is often remarked that the general vasodilatation produced by drugs given systemically may actually direct blood away from an ischaemic area, and intra-arterial injection has been suggested as a way of ensuring local vasodilatation in the diseased area. This route should be able to direct a small dose exactly where required. Intra-arterial injection can, however, be only seldom performed, and its action is likely to be transient.

A wide variety of vasodilators—such as ether, alcohol, procaine, and other drugs—have been used for some years in Continental practice as intra-arterial injections for peripheral ischaemia, and there have been recent reports on their use in the American and British journals. Mackey[1] treated patients by an intra-arterial drip infusion of histamine under pressure: a course of ten weekly infusions was given to each patient. The immediate response was flushing of the thigh, sometimes followed by wheal formation in the skin. Nine out of fourteen patients were thought to be improved, and no ill-effects were noticed. In last week's *Journal* (p. 808) Dr. H. S. Pemberton and his colleagues in Liverpool described the results of their trials of several drugs used intra-arterially for the treatment of arterial disease in the legs. Many of the injections were given rapidly and at less frequent intervals than in Mackey's series, and the authors were able to report improvement in many cases. Only one complication occurred.

[1] *British Medical Journal*, 1950, **2**, 1086.
[2] *Lancet*, 1950, **2**, 676.

Before this method can be accepted in clinical practice two questions must be answered—does it in fact produce improvement greater than may occur naturally in a control series of untreated patients, and, secondly, is there any physiological evidence that such injections cause effective or prolonged vasodilatation? Spontaneous improvement, presumably occurring with changes in the collateral circulation, often takes place in patients with arteriosclerosis: intermittent claudication is a symptom well known to change for the better. It is therefore difficult to exclude the possibility that the patients treated by Mackey and by Pemberton and his colleagues might have improved under natural conditions. Unfortunately no one has yet published studies on the natural history of occlusive arterial disease which might be used for comparative purposes. Physiological data on the effects of vasodilator drugs have been reported by Lynn,[2] who showed that an intravenous dose of 50 mg. of tolazoline ("priscol") produced a rise in foot blood flow lasting half an hour, whereas the same dose given intra-arterially gave a greater rise lasting a few minutes longer. Lynn did not observe any fall in blood pressure after the intravenous injections, so that the theoretical objection that hypotension may reduce peripheral blood flow was not upheld in the case of this drug. These recent studies are stimulating, but cannot be said to have proved that intra-arterial injections are of sufficient benefit to warrant their general adoption. Arterial puncture does carry some risk, slight though it may be, and it should not be done without quite definite indication.

SCIENTIFIC EXHIBITION AT THE ANNUAL MEETING

The scientific exhibition at the Joint Annual Meeting in Dublin this year was a great success, thanks to the pioneer work of the organizers and to those who came forward with exhibits. Among the subjects chosen for display were the chemotherapy of tuberculosis, plastic surgery, malaria, the surgery of mitral stenosis, new contrast materials for radiography, tissue transplantation, and isotope therapy. Those who visited the exhibition found this method of demonstrating work in progress a welcome change from set lectures and discussions. Next year at the Annual Meeting in Cardiff there is to be a similar exhibition, but on a larger scale. As we said about the proposed exhibition in Dublin, a show of this sort provides unusual opportunities for informal discussion with workers in different fields of medicine, and members attending the Cardiff Meeting next year will certainly find the exhibition a feature of special interest. It is now up to all those interested to put forward their proposals. There is plenty of time between now and next summer for intending exhibitors to prepare their material, but because space is limited applications for a stand should be made to the Secretary of the Association as soon as possible, and in any case not later than December 31. Details of the space available for each exhibit are given on page 879.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE TYPHUS GROUP OF FEVERS

BY

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PART II

Q Fever

Q fever was first described by Derrick in Queensland in 1937. Burnet and Freeman identified the causal organism as one of the rickettsiae, later to be named *R. burneti*. Philip has proposed an alternative term, *Coxiella burnetii* Derrick. About the same time a similar organism was isolated by Davis and Cox from the tick *Dermacentor andersoni*, in the Western United States. Laboratory comparison of the Australian and American strains proved their identity. Elsewhere it remained a medical curiosity until the second world war, when troop movements served as indicators of "silent areas" of the disease, particularly in the Mediterranean littoral. More recently outbreaks among stockyard workers have stimulated intensive study by epidemiologists and experimental pathologists, and reports of its identification in Europe, the Americas, and North Africa have been frequent. In Great Britain cases have been recorded from several counties.

Clinical Syndrome.—This is of variable duration and severity. Preceded by an incubation period of 14–26 days, the onset is usually abrupt, with headache, myalgia, fever, chills, and sweating. Fever, ranging between 101 and 104° F. (38.3 and 40° C.), with pronounced daily fluctuations, and a relatively slow pulse persist usually for four to seven days. Lung symptoms become prominent about the fifth day, with the development of a dry cough and pain; and radiography reveals pulmonary involvement, consisting typically of patchy areas of increased density of ground-glass appearance, usually in the periphery of the lower lobes. Resolution takes about two weeks. Occasionally the pulmonary signs may occur without fever, and vice versa. Pleural effusion is rare. In most instances the clinical course is mild, complications are uncommon, and convalescence is rapid. During the past three or four years, however, it has become clear that the syndrome, once thought to be uniformly mild and brief, may occasionally be of much greater duration and severity. Thus Lennette and his associates, investigating a series of 180 unusually severe cases in California, found the duration of fever to average 13 days, and to exceed 28 days in 30 patients aged 40 years or over, with prolongation of the residual weakness and fatigue for several weeks. Fatal cases are rare.

Morbid Anatomy and Laboratory Diagnosis.—The two or three necropsy reports recorded in the literature indicate that the essential findings are in the lung and spleen. In the former there is congestion, oedema, and lobar pneumonia or broncho-pneumonia. The latter resembles an acute splenic tumour. Laboratory diagnosis has an enhanced importance, since until the pulmonary lesion becomes evident the clinical diagnosis may be in doubt. The Weil–Felix reaction is negative. Isolation of the organism in guinea-pigs is simple. Complement-fixing and agglutinating antibodies appear in the patient's serum; the former are highly specific and persist for at least four years.

Epidemiology.—Australian and American workers have found certain species of tick to be heavily infected in nature; as also are sheep and goats. The disease is transmitted to sheep, goats, and dairy cattle by infected ticks; man is usually infected by the inhalation of dust-laden air contaminated by tick-faeces or excretions from infected cattle. The causal organism has often been recovered from the placenta, milk, and udder of these animals. The infection is thus an occupational hazard in certain groups of workers—for example, those engaged in abattoirs, packing-houses, and dairies, and in the preparation of hides.

Control Measures.—The differing methods of transmission indicate that these measures can be most profitably devised in relation to the known or suspected circumstances of transmission in any particular outbreak. They would thus variously include the sterilization of the excreta and sputum of patients, the suppression of dust, and the very thorough pasteurization of raw milk, to which latter process the organism seems to be more resistant than is the tubercle bacillus. Egg-vaccines have given promising results in America, and may well find application for laboratory workers handling *R. burneti* and for abattoir and dairy workers.

Rocky Mountain Spotted Fever

This tick-borne disease occurs only in North and South America. Closely akin to it, however, are boutonneuse fever, endemic in the Mediterranean littoral, and the tick-borne fevers of South Africa, and perhaps those of Equatorial Africa, India, North Queensland, and Siberia. Therefore, to maintain perspective, it deserves brief mention. It is an acute endemic infectious disease, the causal organism being *Rickettsia rickettsi*, and the principal vector is the wood-tick, *Dermacentor andersoni*, in the Rocky Mountain region, and other ticks elsewhere. Clinically it resembles other rickettsial fevers; but the rash is more profuse, intense, and petechial, and gangrene of the scrotum more frequent. Man is an incidental victim when he intrudes into the tick–rodent–tick cycle of transmission. The Weil–Felix reaction is positive and of the OX19 type, although occasionally agglutination of the OX2 strain of *Proteus* predominates. Protection tests are much used. The complement-fixation test differentiates the disease from louse-borne, flea-borne, and mite-borne fevers, and from Q fever and boutonneuse fever. The use of D.D.T. powder on dogs and cats, and immunization by vaccines prepared from infected ticks or yolk-sac material, are effective methods of control.

Boutonneuse Fever

(*Synonyms:* fièvre boutonneuse, Marseilles fever, eruptive fever.) This acute tick-borne febrile disease, first described in 1910 in Tunis, is prevalent in the Mediterranean littoral and perhaps further afield in Africa. It is a variety of Rocky Mountain spotted fever. A dermal lesion with attendant bubo, identical with that of scrub typhus, usually marks the tick-bite. This apart, it resembles Rocky Mountain spotted fever clinically, but is milder; cerebral symptoms are rare; the death rate is about 5%. The causal organism is the *Rickettsia conori*, which is transmitted by the dog-tick, *Rhipicephalus sanguineus*. Conclusive evidence concerning the reservoir is lacking. Epidemiological studies point to an association with dogs, but no canine strain has yet been recovered in nature. The role of the dog may be indirect only; transovarian passage in the tick and the longevity of the organism in the tick and its faeces may alone be adequate to maintain the cycle of trans-

mission. In the guinea-pig there is reciprocal cross-immunity between boutonneuse fever and Rocky Mountain spotted fever. The two diseases may be differentiated by the failure of spotted fever vaccine to immunize against boutonneuse fever and by the complement-fixation test. Kenya typhus and South African tick typhus are closely related to it. The Weil–Felix reaction is positive in early convalescence; titres with the OX2 strain of *Proteus* may equal those of the OX19 strain. The anti-tick measures described for spotted fever are applicable.

Other Tick-borne Typhus Fevers

These merit only passing mention in this brief account. South African tick-bite fever, the tick typhus of Equatorial Africa, and the tick typhus of India and of North Queensland all bear resemblance to boutonneuse fever. The first- and last-named are, however, thought to be distinct entities.

Rickettsialpox

This most recent addition to the rickettsial fevers, first identified in 1946 in New York City, and later in Boston, has certain clinical resemblances to scrub typhus and to chicken-pox. The abrupt onset, fever, and headache are typically those of the typhus group, though mild and brief; but the maculo-papular lesions of the rash develop vesicles that dry to form a black crust which falls off within seven days, leaving no scar. The Weil–Felix reaction is negative. Strains may be isolated and maintained in the guinea-pig and mouse. The causal organism is the *Rickettsia akari*, resembling *R. prowazeki*. Strains have been recovered from house-mice (*Mus musculus*) and from rodent mites (*Allodermanyssus sanguineus*). Early results of immunological tests suggest that the disease is related to the spotted fever group.

Therapy

During the past five years the problem of the treatment of all rickettsial diseases has been essentially solved by the discovery of three wide-range antibiotics—chloramphenicol, aureomycin, and terramycin—all of low toxicity in the recognized therapeutic doses and readily absorbed from the gastro-intestinal tract. In those rickettsial diseases most thoroughly investigated, amongst them those of the gravest prognosis—namely, typhus exanthematicus, scrub typhus, and Rocky Mountain spotted fever—these antibiotics have proved to be a veritable therapeutic scythe. The clinical manifestations are abolished within two to three days. Relapses are very uncommon, and invariably respond to re-treatment; the development of any degree of drug-resistance that might interfere with this has not occurred. The antibiotics are effective even when given quite late in the course of the disease, although defervescence may then take a day longer and require longer therapy. Their efficacy will be exemplified by the use of chloramphenicol in scrub typhus, since this has been extensive and the results differ little from those obtained in other members of the rickettsial group. In Q fever and rickettsialpox some reservation about their specificity must be made: in the former because of its variable severity; in the latter for lack of sufficient data.

In 1947 Smadel and his associates at the United States Army Medical Research and Graduate School, working with eggs and mice, showed that chloramphenicol acted powerfully on experimental scrub typhus. Trial in the human disease was clearly warranted, and collaborative studies were speedily instituted in Malaya, where the occupational nature of the disease ensured a succession of patients among estate labour and military personnel. Of some 150 cases treated, all responded promptly.

The drug is given orally in gelatin capsules, usually as an initial dose of 3 to 4 g., calculated on a basis of 60 mg. per kg. of body weight, followed by 0.25 g. at three-hourly intervals for 24 hours. For ill-nourished patients some prefer a smaller initial dose, or to split it into three and to give 1 g. hourly. Giles and Symington used with success only a single dose of 3 g. For about 12 hours the clinical condition remains unchanged. Thereafter toxicity declines sharply, and within 48 hours the patient is afebrile, placid, and clamant for food. This success prompted Smadel and his colleagues to make prophylactic trials in volunteers exposed to infection in hyperendemic areas. They showed that, in one such trial, a weekly dose of 4 g. of chloramphenicol given for six weeks was so effective that only 1 of 31 volunteers developed typical scrub typhus, in contrast with an incidence of 13 cases amongst the 18 volunteers of the control group. These trials continue.

From these trials has emerged an unexpected finding. Those who have contracted the disease occupationally rarely come under treatment before the seventh day; in these, relapse never occurs. In contrast, in volunteers in the field trials close observation enabled chloramphenicol treatment to begin on the second or third day of illness; clinical signs promptly yielded, but in one-half of the cases reappeared after about seven days. This recrudescence at once responded to further chloramphenicol therapy. In some cases a second relapse occurred. Correlation of these facts with laboratory data from *in vivo* and *in vitro* tests led to the conclusion that chloramphenicol is rickettsiostatic, not rickettsiocidal, and that it suppresses the growth of the organism for about one week, during which time the patient develops his protective mechanism, under the stimulus of rickettsial antigen. But only in those treated late has this mechanism progressed enough for the added suppressive effect of the antibiotic to ensure an overwhelming immunity.

Aureomycin gives similar results in the therapy of scrub typhus, including relapses in cases treated very early and the prompt response to further treatment. Terramycin lacks extensive trial; but Smadel and his colleagues found it effective in eight patients, though less prompt (by 12–24 hours) in securing defervescence. For the treatment of scrub typhus their order of preference is chloramphenicol, aureomycin, and terramycin, based on slight differences in occasional and mild side-effects—namely, nausea and vomiting, looseness of stools, and a glossitis and thrush—none of them serious. During the treatment with chloramphenicol of some 300 patients suffering from scrub typhus or typhoid in Malaya no side-effects of note were observed. Drug-levels in blood or urine, however interesting to the experimental pathologist, are no longer necessary for the administration of any of the three antibiotics in the recognized therapeutic doses.

In the other members of the rickettsial group the recorded numbers of human cases thus treated are fewer. Although occasionally a clinician may express a preference for one or other of the three antibiotics, the results with all are essentially identical with those described above. Q fever, however, is occasionally an exception. Whereas in the experimental disease and in the earliest recorded human cases chloramphenicol and aureomycin seem to have been as consistently successful as in the other rickettsial fevers, Lennette and his co-workers, using aureomycin in 45 severe cases, found it useful but not invariably effective. In 22 defervescence was complete within three days, and in 32 within five days. But in nine it took longer; although within three days a subjective improvement and a sharp drop in temperature did occur, there followed several days of low-grade fever. In four cases improvement was minimal or absent. However, Smadel, Jackson, and Ley have shown that terramycin is much more active than chloramphenicol and aureomycin in experimental Q fever; its use in human cases will therefore be awaited with great interest.

Next Refresher Course Article.—"Vertigo," by Mr. T. E. Cawthorne.

Refresher Course Book.—The first 55 articles of this series (fully revised) are available as a book, price 25s. including postage, from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

LUKE, THE BELOVED PHYSICIAN

Saturday, October 18, commemorates St. Luke's Day. The engraving by Cock, which we reproduce above by courtesy of the Wellcome Historical Medical Museum, is from the painting by Martin Heemskerk (1498–1574). It shows St. Luke inspecting a flask of urine (it was painted at a time when uroscopy was one of the principal methods of diagnosis). On the left is the ox, an emblem of sacrifice generally attributed to St. Luke. In a letter to the *Journal* about the celebration of St. Luke's Day, Mr. H. Caiger (Banstead, Surrey) writes as follows: "We do well to honour the memory of the patron saint of our profession. As has been said in these columns on a former occasion, Ernest Renan, the famous French critic and sceptic of a century ago, spoke of the Gospel of Luke as 'the most beautiful book we possess.' We may well join our prayers with those of the Church all over the world, that by the prescriptions Luke has left us all the diseases of the world's mind and heart, all its foolishness and selfishness, may be healed. All down the centuries countless men and women who have trusted Luke and faithfully followed his prescriptions have proved them of lasting value."

THE NEW ACADEMIC YEAR

WESTMINSTER MEDICAL SCHOOL

Two Learned and Practical Professions

The inaugural address at the new session at Westminster Hospital Medical School was delivered at Church House on October 6 by Sir Raymond Evershed, Master of the Rolls.

In the Bar, from which judges were chosen, said Sir Raymond Evershed, it was perhaps most natural to emphasize the academic side of the legal profession. Its numbers were small, and those who practised lived together in the Inns of Court in a kind of collegiate life. Yet the emphasis which the law had always contrived to place upon the practical was rather impressive. Lawyers had tended to fight shy of jurisprudence as such and judges had been loath to accept general judicial principles. They had conceived their function to be rather like that of the medical man who dealt with the particular case. This empirical method of approach which distinguished the administration of the law in England might derive from the fact that we had never had here a comprehensive code. The law had been allowed to develop from case to case, and had thus acquired a flexibility which otherwise would have been difficult to attain. For example, there was no statute of the realm which stated that murder was a crime.

The medical profession was far more numerous and far more scattered than the Bar, and it might well be that a practitioner, perhaps in a remote part of the island, was apt to concentrate on the many and difficult jobs at hand and to forget the duty and obligation which he owed to the profession as a whole. Sir Raymond Evershed begged those before him never to forget that they were members of a learned profession to which an obligation was due, and in which the standards of truth and integrity had been built up by great minds, making the profession of medicine, like that of the law, a civilizing influence for humanity all over the world. In both medicine and law the quality of the individual was of the highest importance. Oliver Goldsmith 200 years ago wrote that "just as ten million circles can never make a square, so the united voices of myriads cannot lend the smallest foundation to falsehood." He wondered whether Goldsmith would say quite the same thing to-day in an age of advertisement and propaganda. By constant repetition something which was not necessarily true became regarded by multitudes as the truth. It was more cogent than ever that truth called for eternal vigilance. "Unless you put your standards high," Sir Raymond Evershed concluded, "and rate yourselves high, nobody else will do so."

UNIVERSITY OF SHEFFIELD

The Advance of Medical Science and its Social Consequences

Sir Edward Mellanby delivered the inaugural address at the opening of the new session of the Faculty of Medicine, Sheffield University, on October 9. His subject was "The Advance of Medical Science."

Sir Edward Mellanby recalled the 13 happy years he had spent in Sheffield as physician at the Royal Infirmary and professor of pharmacology at the University. He said it must be difficult for the present-day medical student to grasp the revolution that had taken place in medical practice during the present century. In 1911, when he qualified, curative medicine hardly existed, and except in one or two instances, such as mercury and potassium iodide for syphilis and quinine for malaria, all treatment was symptomatic; only the surgeon cured disease by his radical methods. Now, thanks largely to discoveries made in laboratories by the adoption of the experimental method, the physician was a most effective agent in curing many diseases. The dynamic side of medical science must be appreciated by every medical student, for he would have to live and work in a period of similar but greater advance in knowledge.

The chief fact of the present situation was that most of the major killing diseases of early life and middle age were now either preventable or curable. It was true that some diseases were proving intractable and might even be on the increase, but, except for cancer, they did not have the same devastating effects on life, but caused great disability and demanded much medical attention. They represented one of the great challenges to present medical research. The two outstanding physical effects of the modern conquest of disease were the great increase in world population and the increase in life-span resulting in an ageing population, both subjects of public interest at the present time. The advance of medical science had greatly encouraged the public outlook, which had led to the welfare State and especially the National Health Service Act. The latter would indeed have been a poor project if the science had remained as it was at the beginning of the century.

The philanthropic and emotional attitude of the public towards sickness and the resulting sense of personal responsibility had now been largely replaced by State action, and this, together with the modern demand for economy and efficiency, might ultimately eliminate the sense of benevolence in matters of public ill-health. With greater knowledge of the cause of disease, responsibility for sickness would more and more be related to individual behaviour. If it did, then we might ultimately develop the public attitude towards ill-health so well described by Samuel Butler in *Erewhon*, where the sick person tried to hide his disability, which, if discovered, resulted in his imprisonment. Even the religious outlook of the community was being affected by the rapidly increasing span of life and by the great decrease in personal and family tragedy associated with illness and untimely

death. In keeping with this view, some of the newer religious cults, especially those initiated in America, seemed to have more worldly outlook than that of the older-established Christian denominations. Increased security of health and long life would probably encourage a more pagan outlook.

The lecturer finally discussed the main problems of medical research that lay ahead. It looked as if mistakes in present modes of living were important causative factors in some of the present common diseases. Then there were the degenerative diseases of middle and old age and senescence itself. They were all practical problems, and with the aid of the experimental method the research worker need not be daunted.

WELSH NATIONAL SCHOOL OF MEDICINE

Chance and Design in Medical Research

Professor J. Henry Dible delivered the inaugural address at the new session of the Welsh National School of Medicine on October 9 at Cardiff. His subject was "Chance, Design, and Discovery."

Professor Dible traced the history of a number of discoveries of fundamental importance in medicine and, in so doing, spoke of the advantage of a knowledge of the history of medical discoveries. This was of itself a branch of knowledge and therefore to be pursued by those who hoped to graduate in a learned profession. It gave a clear understanding of how the present position had been reached, which was better than a mere knowledge of the dry facts, and, for his part, as a teacher, he had found that it aided memory. He illustrated the stages in discovery by the story of pernicious anaemia, which took its departure from the observations of Fenwick upon the associated gastric disorder, which in turn became linked to Whipple's finding on the action of liver on blood regeneration, and those of Castle on intragastric digestion, and, finally, on the clinical trials by Minot and Murphy.

In discussing the parts played by planned research and chance Professor Dible illustrated the logical progress of an idea by the researches of Pasteur and of Ehrlich, and showed occasions on which chance and the intrusion of the ideas of others had influenced the work of both of these masters of method. The greatest factor of all in discovery was certainly chance, but in accepting this proposition it was essential to link it to Pasteur's dictum that "in the field of observation chance favours only the prepared mind." It was also necessary to take into account the extent of the development of technical methods, since the fruit of certain fundamental observations could only be got if the necessary technical equipment was available. But it was a great error to believe that elaborate apparatus was necessary for new discoveries any more than it was for new ideas. Nor did the possession of elaborate technical equipment necessarily lead to discovery. In fact, there was the possibility that it might have the reverse effect and the man be limited by the machine. The working of chance was to be seen in most great discoveries, such as those of von Mering and Minkowski on diabetes, Eijkman on beriberi, Fleming on penicillin, and many others. It could be said that progress from known data could be planned, but discovery was like a biological mutation: a chance mutation.

The study of the history of these great steps in the advance of medical knowledge left the speaker with a very diminished opinion of the prowess of man's intellect, and it should engender a corresponding humility. Neither should we be prepared to accept uncritically medical dogma or direction by authority—a danger to be the more aware of as State control of medicine advanced. Medical history showed that the dogma of to-day was the error of to-morrow. Nor should we reject new ideas because they ran contrary to established authority. The Royal Society's treatment of Jenner's findings might be remembered as a warning, and he reminded his hearers of the recent discovery in the sea off South Africa of a fish which had confidently been "known" to have become extinct 60 million years ago with the last of the dinosaurs. The cultivation of the spirit of inquiry was above all to be commended, and though this did not always yield a glittering prize it made for better doctors.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

The Teaching of General Practice

The opening ceremony of the session at University College Hospital Medical School took place in London on October 7, when the opening address was delivered by Sir Wilson Jameson and Lady Jameson distributed the prizes.

Sir Wilson Jameson began by reminding the company that University College Hospital, like other great medical foundations in London, was established primarily for teaching, and not as a charity for the poor—a thing which should not be forgotten by those interested in medical education. When the National Health Service came in he had rejoiced that the teaching hospitals of London had been given a large measure of independence and were entitled to retain their endowments. The intention was that certain of these hospitals should have something approaching academic independence, with freedom to experiment in educational methods and to conduct research.

It was important that medical students should be given as far as possible a proper understanding of what the medical care of the patient really meant, and not just hospital care. A student should be able to study illness and its prevention from the point of view of the family doctor aided by the services of the local authority and the hospital out-patient department. In recent years a hospital career had been made to seem rather more attractive than general practice, though the majority of students would find in general practice their lifework, and a very happy one it could be. A number of well-known general practitioners had got together to try to form a college of general practice, and arrangements were being made in a number of schools for a student to spend some time with a general practitioner. But it seemed to him that this, however welcome, was not enough. This aspect of medical training should be taken very seriously in the medical school. In Manchester a health centre was shortly to be established which would later on be used for teaching purposes. There were developments of the kind elsewhere, and he had been wondering whether University College Hospital Medical School and its hospital between them, with their great traditions of progress, could not do something along the same lines. It would not be easy to arrange, but it would be rewarding.

UNIVERSITY OF BIRMINGHAM

The Scientific Approach in Medicine

Professor G. W. Pickering presented the prizes and gave the inaugural address at the opening of the new session of the Birmingham University Faculty of Medicine on October 6. Afterwards there was an informal conversazione in the Medical School.

Professor Pickering spoke on "Opportunity and the Universities." He said that there were many opportunities, but the greatest and most timely was to develop the teaching of clinical science in the universities. Some teaching in clinical science should be given to the abler undergraduates, but the most important in its effects on standards of thought in the profession would be an honours course leading to a higher degree.

Professor Pickering drew attention to the alarming increase in the compulsory requirements for undergraduate and postgraduate education, which it had been suggested should total 14 years for intending specialists. He could not imagine a more effective method of arresting progress in medicine, and would not suggest that undergraduate and postgraduate courses in clinical science should be compulsory.

SCIENTIFIC EXHIBITION AT ANNUAL MEETING

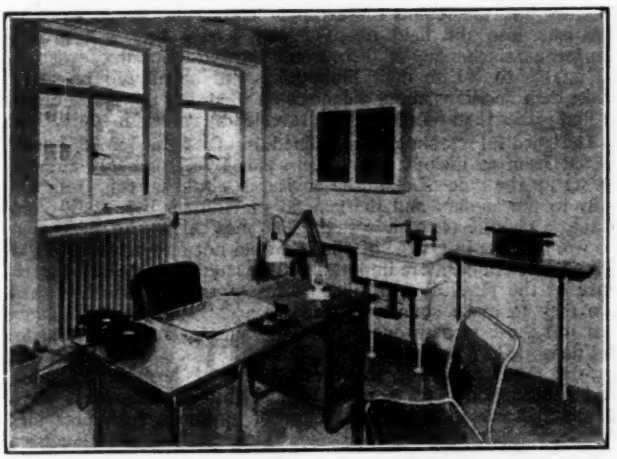
The scientific exhibition at the Association's annual meeting at Dublin this year was a success, and it has been decided to repeat the exhibition at Cardiff next year. The scientific exhibition will be housed in the Sophia Gardens Pavilion, near the trade exhibition but separate from it. Neither exhibition will be open to the public. Acceptance of exhibits for the scientific exhibition is at the sole discretion of a special subcommittee of the Arrangements Committee.

Space is likely to be limited, so exhibitors are advised to apply early for a stand. Each exhibitor will be provided with a stand having a frontage of 10 ft. and a depth of 6 ft. The side and back walls will be 9 ft. high. A 1-ft.-wide shelf will be fitted on the back and side walls at a height of 2 ft. 6 in. above the floor. Normal lighting and adequate electric points (A.C. 250 V.) will be provided. The exhibitor will be responsible for the cost of preparation, transport, and setting up of his exhibit. There will be ample free storage space for containers. Expenses incurred in connexion with demonstrators or attendants must be borne by the exhibitors. *The showing of motion pictures on the display stands is not permitted.*

Applications for stands will be received up to December 31, 1952. Forms of application and full particulars can be obtained from the Secretary, B.M.A. House, Tavistock Square, London, W.C.1.

WOODBERRY DOWN HEALTH CENTRE

The new health centre on Woodberry Down Housing Estate, London, N.16, was opened on October 14. Six general practitioners, two dentists, one pharmacist (part-time), and two nurses will eventually work at the centre. The illustration shows a general practitioner's consulting-room. The other services to be provided include antenatal, school health, and child welfare. Space is provided for an *x*-ray plant, but it will at present house only dental *x*-ray apparatus. Each doctor has a consulting-room and an examination-room. There is a large common-room where the general practitioners may meet each other and members of the public health medical staff visiting the centre. The cost of erection was about £163,000, which includes provision of a day nursery and child guidance clinic. The annual rent for a general practitioner is £350. A report of the opening will appear in the next issue of the *Journal*.



Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Perseverance in Artificial Respiration

SIR,—I write this letter at the request of the Chief Electrical Inspector of Factories in regard to electrical accidents needing resuscitation. Of 211 such cases in five recent years, recorded in Electrical Accidents and their Causes, 1949 (H.M.S.O., 1951), only half regained consciousness and only two were persisted in for two to four hours. Delay in starting artificial respiration was infrequent. But even recently there have been cases where the doctor has stopped resuscitation—as hopeless—after only one-quarter or half an hour. This has discouraged the first-aid operators, whose handbooks instruct them to persevere for four hours in drowning cases and for eight hours in electrical accidents.

Evidently it is not always realized that the ordinary signs of death—absent pulse and inaudible heart—are not reliable in these cases, and reports are heard that first-aiders have revived victims (one electrical) after a doctor had pronounced life extinct. Apparently there are cases, aptly called suspended animation, which are not understood, in which the heart presumably ticks over undetectably. Hence, if I was called to a case which was being treated by the rocking method—10 times a minute at 45 degrees each way, with unobstructed airway, oxygen for the first hour, and adequate warmth—I should not dare to interrupt it for cardiac examination, knowing that it would be inconclusive. As this method only moves the diaphragm up and down, it should not injure the delicate lungs, even if maintained for four to eight hours.

If the Schaefer method was being employed, I should try to substitute the Nielsen method (much better) or make the Schaefer inspiration effective by lifting the chest and epigastrium off the floor (both illustrated in my *Artificial Respiration Explained*, Livingstone, 1946).

My own views and evidence on the duration needed in artificial respiration will be found under "Drowning—Resuscitation" in the *Encyclopaedia of Medical Practice*, 2nd edition, Vol. 4. But I could not find any reports of revivals after four, eight, or even twelve hours, which presumably exist. If anyone can quote such cases they should certainly be published.

In the pamphlet on the Holger-Nielsen method, just published by the Danish Red Cross, perseverance for five hours is advocated.—I am, etc.,

Beverley, Yorks. FRANK C. EVE.

Inhalants in Bronchial Asthma

SIR,—The statistical analysis by Drs. E. Lewis-Faning and E. J. Parr (September 20, p. 632) throws an interesting sidelight on the habits of asthmatics, but we feel it should not be allowed to pass without comment. The authors' conclusion that there is no outstanding difference between the effects of the various inhalants is open to considerable doubt. We agree that Neb. adrenal. et atrop. co. (*N.F.*), "riddobron," and "brovon" have no practical difference. In fact, their formulae are very similar. We also agree that of these three the *N.F.* prescription should be preferred in view of its low cost. The effective ingredients of these inhalants are mainly adrenaline and papaverine. We must point out, however, that isoprenaline ("aleudrin," "neo-epinine," "isupren," and "neodrenal") is, weight for weight, a much more powerful bronchodilator than these substances. There is ample evidence for this from experiments on the bronchus of the dog, the isolated human bronchus, and on the human asthmatic subject.[1 2 3 4] These effects have been measured accurately and compared under standard conditions.

Further, the authors make no reference to several factors which may have contributed to an inaccurate assessment of the various inhalants by their patients. First, both the strong and the weak type of inhalant may give equal relief if the patient is in a mild asthmatic state. Such patients, who presumably have taken part in the present survey, could therefore not have been able to distinguish a stronger inhalant from a weaker one. Secondly, the amount and consistence of the bronchial secretion varies from patient to patient. If the bronchial membrane is covered with a thick layer of viscid mucus it will take longer for an inhalant to penetrate and to become effective than when the bronchial tree is relatively dry. In some of the cases with viscid secretion we have had to resort to 2% and even to 3% isoprenaline before relief was obtained. In these cases, inhalation of Neb. adrenal. et atrop. co. had absolutely no effect. Thirdly, we have seen many cases of conditioned reflexes developing by inhalation in asthmatics, and these reflexes have been produced experimentally in allergic disorders.[5 6] Such reflexes are not mentioned by the authors, but probably account for the patients who were unable to detect the inert control inhalant in the experiment. They might well also have played a part in the favourable assessment of the weaker inhalants.

We give these points in some detail lest the reader should come to the conclusion that it does not matter what inhalant is prescribed to any asthmatic. We believe that there are stronger and weaker inhalants and that they should be prescribed according to the individual needs of the patient.—We are, etc.,

London, W.C.1. Monica K. McAllen.
H. Herxheimer.

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Sickle-cell Anaemia in Africa

Sir,—In your annotation on sickle-cell anaemia in Africa (August 23, p. 433) you refer to the problem of how the frequency of the sickling gene is kept up in populations in the face of the early deaths of homozygous individuals. Whether almost all or only a proportion of homozygotes die young—and there is no doubt that some at any rate do—the gene should be quite rapidly removed from the population by selection. Foy and Kondi[1] have suggested that the mechanism may be one of increased fertility in bearers of the trait, coupled with selective mating between sicklers; this is apparently the case in thalassaemia. As you point out, however, there would have to be a marked increase in fertility to compensate for the death rate in homozygotes. A preliminary unpublished study of the sizes of the families from which adult sicklers and non-sicklers are drawn shows no appreciable difference. As for selective mating, it is hard to see how the presence of the gene is recognized in the heterozygote without an examination of the blood.

I have recently produced figures[2] which, although inadequate, suggest that the mechanism may be one of positive selection for the heterozygote—that is, that bearers of the trait enjoy an advantage in health over normal people. This had in fact been tentatively suggested by Raper,[3] though he did not regard it as very likely. Neel[4] regarded it as the most likely solution of the problem, though he admitted that the available evidence was, if anything, against it. It appears to be a fact, first noted by Beet[5] and confirmed by my own experience, that the spleen is palpable in a considerably lower proportion of sicklers than non-sicklers. This may, as some have suggested, mean that the spleen has become small and fibrotic through repeated infarctions; on the other hand the explanation may be that the red cells in sicklers offer a less favourable environment for malaria parasites. I hope to elaborate this elsewhere; but it appears that positive selection for the trait must at any rate be considered as a possible factor in the maintenance of the gene frequency.—I am, etc.,

Shabanie Mine Hospital, Southern Rhodesia. Peter Brain.

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Psychology and Psychiatry

Sir,—Whilst agreeing with the general trend of Dr. R. Macdonald Ladell's argument (September 20, p. 669), I feel bound to join issue on certain views expressed concerning the present inadequacy of psychiatric out-patient treatment and his suggested remedy.

It is true that the pressure of work in many of these clinics is steadily increasing and the ideal of full personal inquiry is consequently becoming more remote. Despite this, however, I am sure that most psychiatrists arrange their clinic time so that the patients who can benefit most receive most attention. In the present state of our knowledge there are many cases for whom we can do little other than make a diagnosis. I do not feel it to be any more right to raise the hopes of an untreatable anxiety state by offering lengthy psychotherapy than it is in the average case of physical disease. The trained psychiatrist with his main work based on the modern mental hospital and constantly engaged in all forms of treatment is, unlike his colleague of twenty years ago, in an unrivalled position to judge of the efficacy of various treatments in any particular case. As to-day he is seeing a very wide range of cases and is increasingly occupied by the neuroses, his judgments are correspondingly based on a footing of sound common sense. This is more than can be said of many who practise in a detached fashion, and who often see only a narrow cross-section of cases, and become too readily obsessed with one particular line of treatment.

Treatment is the sole prerogative of the doctor who specializes in psychological medicine, and he alone should be trusted to carry it out. The psychologist and the psychiatric social worker have very important and well-known roles to play, but their work should be integrated with that of the psychiatrist and not allowed to stray into the realms of therapy. Those who would stray as amateurs into the field of psychiatry would be, as a group, dangerous, since many of them would have insufficient knowledge, be unable to realize their limitations, and be all too prone to make their decisions about diagnosis on what they think they ought to find rather than on the facts as revealed by careful investigation.

The medical psychologists defined by Dr. Macdonald Ladell would seem to include many such, and I feel that any attempt to set up the type of clinic he envisages would be confusing not only to the layman and the general practitioner but would constitute a definite retrograde step. The medical psychologists that he would place in charge of clinics would not only have no paper qualifications but, more important still, would have no real experience of the physical and allied forms of treatment. How then are they to make sound decisions regarding treatment? There are still those who through their ignorance regard it as distasteful to work in a mental hospital, but without a period of training in the departments of the modern mental hospital I cannot feel that anyone has a right to feel himself competent as a psychiatrist or to have that sense of proportion so necessary in psychiatry and for the lack of which we have so often been quite rightly ridiculed.

Much has been achieved in ridding our ranks of the undesirables, for perhaps no specialty has carried so many, but, as the application of scientific principles begins to change the face of our much-maligned specialty, it is most important that progress shall not be retarded by the pseudo-specialist. Psychological medicine will eventually take its rightful place in the forefront of medicine, but this will not arise overnight or even in a generation.

The demand for trained psychiatrists can only be met in two ways. First, by increasing the incentive so that more of the better men available to our profession make their career in the specialty, and, secondly, by streamlining the present time-consuming non-medical duties in the psychiatric hospital, particularly certain of the legally imposed statutory

notes. Modification of the law concerning voluntary admission to allow complete freedom from the obligation to write regular statutory notes would free much of the psychiatrist's time for treatment in both hospital and clinic.—I am, etc.,

Dorchester. ALBANY G. HUCKER.

Why No Rocking?

SIR,—In the course of the last 50 years it would appear that the custom of rocking babies has practically died out in this country. Records going back to the earliest times show that the custom of rocking babies in cradles fitted with rockers was widely practised in many parts of the world. We ourselves have an old saying: "The hand that rocks the cradle rules the world."

There is no doubt that the rhythmic movement of rocking is particularly gratifying to a baby or small child and induces relaxation and sleep. It is particularly noticeable that children deprived of a normal home life, and who show emotional deviation in consequence, habitually rock themselves either from side to side or to and fro. A recent film on the rehabilitation of deprived children made by Dr. Jenny Rudinescu, of Paris, as part of a research undertaken for the World Health Organization, illustrates this strikingly. It is true that the modern pram which has resilient springs provides the child with a somewhat similar sensation for at least part of the day, but it certainly does not replace the old rocking cradle.

It would be interesting to know why the custom has fallen into disuse, since it obviously gives so much satisfaction to babies and would not appear to be in any way emotionally undesirable or to have produced any unfavourable results in the past. We have not only ceased to rock babies but we have also stopped rocking ourselves. In my childhood one could hardly go into a house without finding at least one rocking chair, whereas now they have become almost museum pieces. Rocking is still used a great deal in parts of America. Why have we deprived both ourselves and our children of this form of relaxation? In the stress of the modern world we need more help in relaxing, not less. So why no rocking?—I am, etc.,

London, W.9. DORIS ODLUM.

Asthma in Childhood

SIR,—I have read Dr. C. B. S. Fuller's article, "Asthma in Childhood" (September 20, p. 636), with great interest. I feel strongly on this subject, because I was myself an asthmatic, and I have two brothers who were so afflicted. My mother, as well as being an asthmatic, has attacks of angioneurotic oedema. Two of us have mild eczema and one has hay-fever. This should satisfy those who like a family history. Despite this familial tendency to the so-called allergic diseases, I am convinced that asthma is very largely a psychological disorder. I think that this is by far the most important causal factor, particularly in children.

My experience of skin-testing, though admittedly limited, has shown this to be useless in asthma. Desensitizing to the offending protein has produced no improvement in the attacks, and as often as not the patient has never even come into contact with the protein in question. Sensitivity to food, I think, is very rare. All the common offenders, particularly milk, are found to be perfectly well tolerated when the young patient is in hospital. I have yet to find a case where the offending food can be guaranteed to cause an attack of asthma.

In a large number of asthmatic children it is the parents who need treating. Those cases which improve in hospital, at the country or seaside, or in any other change of environment, usually do so because they are removed from the home. Asthma becomes very largely an escape mechanism; escape from such horrors as food-forcing on the part of the parents, or examinations, or unwelcome sport at school. Once the child escapes something unpleasant by his attack, or gets undue attention because of it, the illness becomes a convenient habit and occurs quite unconsciously whenever undue strain occurs.

I therefore believe that treatment should follow certain definite lines, based on the above trend of thought. The parents should be told that the child is normal in all respects and must be so treated. He should never have to eat anything he dislikes, at home or at school, nor should he be made to take part in any sport he dislikes or fears. He should not be treated by a psychiatrist but by an "ordinary" doctor, and, if treated in hospital, should be attended by a general physician and not at a special clinic. Anything which fosters the belief that an asthmatic child is in a "class apart" is bad for the child. As regards the medicinal aspect of treatment, I think this is less important and usually fairly straightforward. Because asthma is a nervous disease, the most useful drugs for the prevention of attacks are bromide, chloral, and phenobarbitone. The antispasmodics undoubtedly give great relief during an attack. I am sure Dr. Fuller is right in mentioning the importance of associated nasal disease, but it is too often blamed for the attacks and its correction often fails to produce the expected dramatic results.

Whilst I realize that my dogmatic remarks may well call down a storm of abuse upon me, I take heart in the knowledge that my own attacks stopped when I left home, those of my elder brother stopped when he went to the war, and my many asthmatic doctor friends assure me they keep free from attacks by carrying an asthma inhaler in the pocket, even though they never use it. These few personal facts alone convince me there must be some truth in my beliefs.—I am, etc.,

London, S.E.5. CYRIL JOSEPHS.

Smokers' Cough

SIR,—Once again we observe the popular fallacy concerning the use of saltpetre in cigarettes. We should like to make the following observations in connexion with Mr. C. Grantham-Hill's letter under the title of "Smokers' Cough" (September 20, p. 670).

No cigarettes made and sold in this country are permitted by Customs and Excise regulations to contain saltpetre, or any substance which could "materially increase the weight" of the tobacco. Also, no manufacturers make use of paper impregnated in any way to make the cigarette smoke quicker. The term "rice paper" when applied to cigarettes only denotes a paper which is thinner than that normally used for the machine-made article. Although thinner, the weight of paper per cigarette is up to 25% greater in the case of the home-made article, owing to the greater width supplied.

We feel that Mr. Grantham-Hill has missed the real reason why his cigarettes tended not to remain alight. It is surely due to the much higher moisture content which is present in the cigarette at the time of making and is removed by the manufacturers before sale, but which he has not removed. Also, a much higher degree of uniformity is obtained in the machine-made article. If, in the particular cases cited, any economy had been achieved, perhaps the smaller amount of tobacco smoked was itself responsible for the disappearance of the cough. We feel it rather disturbing that Mr. Grantham-Hill should have made such misleading statements based on conjecture rather than fact, when his surmises could so easily have been checked.—We are, etc.,

R. D. SUMMERS, Medical Officer.
J. C. GILMOUR, Research Physicist.

Godfrey Phillips Ltd., London, E.1.

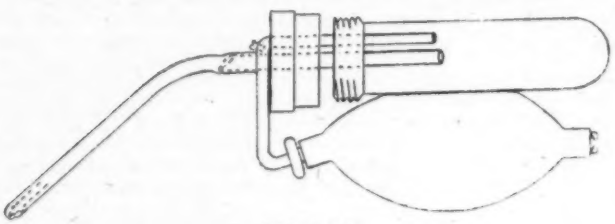
Hand Aspirator for Mucus Extraction

SIR,—For the past two years I have used a hand aspirator for mucus extraction (made to my design by Messrs. A. L. Hawkins, 15, New Cavendish Street, W.1) which appears superior to that illustrated on p. 598 of the March 15 issue of the *Journal*. The aspirator has the following advantages and uses:

Either hand can be used, and the hand is near the infant's face to control it. For aspiration three fingers release the deflated bulb, while the index-finger guides the tube and can open the lips. A bulb with a valve (to eject air only) as illustrated may be used, or one without a valve if the grub-screw is removed and its hole (which opens into the bulb's tube) is occluded by the thumb during suction but not during (re-) compression of the bulb. For

each recompression of the bulb (to allow continuation of aspiration while *in situ*) the thumb occludes the junction of rubber and metal tubes so that no mucus is reinjected. This meets the difficulty that any valve requires a small movement of air to actuate it. The thumb is then shifted and aspiration is resumed.

Early clearing of the pharynx or nares is possible, even before the birth is complete (including breech cases) or the cord tied, as the second hand is free for other purposes. If used before the



Scale 1 : 3

first breath, inhalation of obstructive matter is prevented. Similarly, if fluid regurgitates later, its inhalation may be prevented. No metal tube enters the infant's mouth. A soft rubber tube of fine bore is best. A No. 7 E.G. Jaques catheter cut to 4 in. (10 cm.), with the tip cut across at 45 degrees through the mid-point of the external hole, leaving an almost solid end which is then rounded off, has proved successful. All other tubes and screwed parts are metal.

The aspirator is ideal for domiciliary use. Spare sterile tubes can be carried in containers and the machine is small enough to fit the smallest hand if the diameter of bulb and container together are limited to 3 in. (7.5 cm.).

Artificial respiration can be performed if a bulb without a valve is used, entry to the larynx being easy in apnoea. The method is preferable to the use of the mouth in domiciliary practice.

The aspirator also has uses apart from obstetrics, for instance to clear the pharynx in any condition tending to aspiration pneumonia (for example post-operatively, in coma, regurgitation when unconscious, in whooping-cough), or to empty the stomach. During anaesthesia, if used alongside a tube or airway to remove fluid from the pharynx, it is less injurious than a swab on a holder. The aspirator may also be used to clear the nares or take a post-nasal specimen (or elsewhere). In minor surgery, its use may be preferred to swabbing, which masks the field, in places where a little fluid continually accumulates. (For some uses Dr. J. M. Laurent has suggested a curved tongue depressor, even tubular and sterile inside, to facilitate introduction.)

The illustration shows the glass container unscrewed. The bulb can be larger if desired and is then held sideways or in the palm. To test the suction power for obstetric use it is necessary to indent the bulb slightly; then mouth suction through the tube should be able to deflate the bulb. Rubber and metal parts can be detached when sterilizing. Dr. Mark Fraser's letter (1951, 1, 166) contains *inter alia* useful references to possible uses, but the present design of rubber bulb suction surely meets his objections.—I am, etc.,

North Holmwood, Surrey. HOWARD GOODE.

Lumbar Intervertebral Disk Protrusion

SIR,—I read with interest Mr. R. S. Henderson's article on the treatment of lumbar intervertebral disk protrusion (September 13, p. 597). Mr. Henderson states that it is a disorder with a tendency to natural cure, but first we must be sure that all cases of backache and sciatica diagnosed as slipped disks are due to this cause.

For many years prior to this terminology being used these same patients would have been told that they were suffering from sciatica and not, as now, from a "slipped disk" causing sciatica. If the patient is unfortunate enough to require an operation the surgeon can tell if the condition is due to a disk protrusion, as he can locate it and remove it. Or if the radiologist injects some opaque substance into the spinal canal he can localize a filling defect and demonstrate the site of the disk protrusion. Apart from these two methods I do not think that an absolutely definite diagnosis of disk protrusion can be made. A subluxation of one of the vertebral joints in the lumbar area, or of the lumbo-sacral or sacro-iliac joints, can cause joint strain, with a resultant root pressure causing sciatica and symptoms similar to those of a true disk protrusion. This is the view held by osteopaths, and I have found that by using osteopathic manipulative methods—not just one manipulation, but several over a period of some weeks—many of these disk cases respond satisfactorily. Here I agree with Mr. Henderson that because the condition is essentially subjective it is difficult to assess the results of conservative treatment.

Mr. Henderson says that lumbo-sacral supports, once used, are depended on indefinitely by most patients. This, I feel, is a most unsatisfactory state of affairs, and I do my best, while treating the patients, to have them remove their supports for longer and longer periods until they no longer depend on them. I feel that such supports tend to weaken rather than strengthen the back.

I am always glad to read that operation is playing a smaller part in the treatment of "disk" cases, and that conservative methods are being used more and more. I should, however, like to see more recognition given to osteopathic manipulative care of this condition from people properly qualified to give this type of treatment.—I am, etc.,

Glasgow, C.3. D. M. GRAHAM-SERVICE.

Salt-water Boils

SIR,—Deep-sea fishermen suffer from a septic condition of the wrists and forearms known as salt-water boils. It is due to friction of oilskin sleeves on forearms sodden with salt water. An additional abrasive element, especially in the case of bosuns, is sludge brought up with the catch from the sea bed. I am collecting information in order to obtain:

(*a*) Official recognition as an occupational disease in the schedule.

(*b*) Uniform medical certification in the interests of sufferers.

(*c*) Adequate treatment at sea in accordance with the Ministry of Transport's *The Ship Captain's Medical Guide*, 1946, Amendment No. 4.

I shall be grateful if any medical officers handling these cases would write to me.—I am, etc.,

4, Hamilton Terrace, Milford Haven, Pembs. W. BURNETT EVANS.

Obstruction of the Urethra by Sulphamerazine Crystals

SIR,—The medical memorandum on the above subject by Mr. Ashton Miller and Mr. J. P. Mitchell (September 27, p. 705) prompts me to report a similar case in the hope of underlining this little-known complication of "cremomerazine" therapy. My case differs in that the cremomerazine suspension was administered personally in the precise dosage and at the precise intervals recommended by the manufacturers and in that measures were taken to ensure what was thought to be an adequate fluid intake. The factor precipitating the obstruction was probably a narrowing of the urethral meatus.

Case Report.—A boy aged 3 years was given three teaspoonfuls of cremomerazine suspension one evening for a follicular tonsillitis. Thereafter he was given two teaspoonfuls at intervals of 12 hours for five doses. The suspension was thoroughly shaken before each dose and the total amount given was 13 teaspoonfuls (6.5 g. of sulphamerazine), slightly more than half the amount given in the case reported by Miller and Mitchell. Furthermore, this smaller amount was spread over a longer period—60 hours, as against 36 hours. Copious watery fluids were given throughout the course, and clear urine was voided freely until just before the last dose was taken. Shortly after taking the last dose an acute retention of urine occurred. A probe was inserted into the urethra but met with an obstruction at about half an inch which it was not possible to dislodge. He was admitted to the Huddersfield Royal Infirmary, where, under a general anaesthetic, Mr. M. L. Kennedy performed a meatotomy and scooped away a small amount of gritty material. Recovery was uneventful, but unfortunately the specimen removed failed to reach the laboratory. There can, however, be little doubt that the gritty material consisted of crystals of sulphamerazine.

Comment.—A strong case can be made out against the administration of any sulphonamide in the form of a ready-made suspension, and in particular against the slowly excreted sulphamerazine. Most children will take readily a

crushed tablet of sulphonamide suspended in some suitable vehicle—for example, milk or jam—and by this means accuracy of dosage can be achieved. Furthermore, the average domestic teaspoon, in which the ready-made suspension is usually administered, contains more than 5 ml., the equivalent given by the manufacturers (often about 6 ml.). This, combined with the fact that the suspension appears to thicken as the contents of the bottle diminish, facilitates an overdosage of the drug. The danger of obstruction of the urethra is obviously greater if, for any reason, it is unduly narrowed.—I am, etc.,

Huddersfield. LESLIE BALLON.

Circumcision

SIR,—I do not understand statistics, but in the article on circumcision in 4-year-old children (October 4, p. 755) Dr. D. MacCarthy, Dr. J. W. B. Douglas, and Mr. C. Mogford state, "There is certainly no evidence that, by early circumcisions, children who would otherwise have needed the operation at a later age, when it is more distressing, have been spared it." I cannot see that this is logical; so far as the *individual* is concerned, if he has had the operation he cannot later have to have it again, and the authors will never now be able to tell whether he, the individual, would ever have developed phimosis, paraphimosis, or balanitis, and required the operation. He has not been spared the operation, but he has without doubt been spared its occurrence at a later date and the complications. I agree that the real chance of his having trouble with his foreskin may be so remote that, taking him and his like in the mass, no difference is detectable.

As you say (p. 766) professional people show more capacity for planning. If they are general practitioners, they will have been distressed by the howling 6-year-old at 4 a.m. with paraphimosis, or embarrassed by the necessity of excluding V.D. in a sensitive young man with non-specific balanitis involving him perhaps in weeks of anxiety and suspense. These cases are not so very rare and are not included in the information we have to date. Professional people may feel that they are so psychologically as well as physically distressing as to justify routine circumcision when it should be safe, not distressing; they may see these children as individuals.

These two articles by Dr. D. Gairdner (December 24, 1949, p. 1433) and the present authors are valuable when one wishes to discourage mass routine operation, which I certainly do not practise, but they do not yet give the whole story. And when an intelligent and educated parent requests the operation one may, I suggest, discuss the pros and cons with him, and if he is still insistent, carry out the operation without loss of professional self-esteem and without Freudian afterthoughts.—I am, etc.,

Amble, Northumberland. R. P. ROBERTSON.

Dangers of Intrathecal Penicillin

SIR,—I was interested in the letter of Drs. V. Edmunds and R. J. Porter (September 20, p. 668). I agree with their observations on the danger of the intrathecal administration of excessive doses of penicillin even in its present pure form, and I should like to quote a similar case to theirs.

A male child, aged 6 years, was admitted to hospital because of a meningococcal meningitis, and was given what was thought to be 10,000 units of crystalline penicillin intrathecally. Within an hour he became stuporous and he appeared shocked with a rapid thready pulse, ashen colour, and cold and sweating. He had muscular twitchings of the face and arms. After 24 hours the child regained consciousness and made an uneventful recovery with no after effects.

On investigating the matter, it was found that the staff nurse who had prepared the injection had, by mistake, put 10 ml. of sterile water into a 1,000,000-units instead of a 100,000-units ampoule, and had drawn 1 ml. of this solution into the syringe. This dose—that is, 100,000 units—was subsequently given intrathecally.—I am, etc.,

M. S. PATHY.

Evacuation of Subungual Haematoma

SIR,—I would like to suggest a method of evacuation of subungual haematoma which is very simple and, I believe, less likely to cause pain than the usual method of trephining with a burr or scalpel point described in many surgical textbooks.

The nail is touched, at the site of trephining for a haematoma, with the red-hot end of a blunt piece of wire about the gauge of a common paper-clip. Very slight downward pressure is exerted and a small hole is burned immediately in the nail, with the release of tension of the haematoma. This operation is quickly prepared for, and done in an instant and painlessly. The results are excellent, and on many occasions the nail is saved.

I have formed the habit of carrying a paper-clip in my waistcoat pocket for this purpose, and as a result evacuate subungual haematomas far more readily than before.—I am, etc.,

Stoke-on-Trent. ROGER D. WILLCOCK.

An Operation for Femoral Hernia

SIR,—Mr. Eric Coldrey's description of his operation for femoral hernia (September 27, p. 726) emphasizes the dissatisfaction of many surgeons with the procedures commonly employed. The method of repair described by the late Mr. Peter McEvedy[1] does not appear to have received the publicity which it deserves, and it may not be out of place to draw attention to its many advantages. The approach he suggested gives a superb exposure of the sac, the femoral canal, the bladder, the ileo-pectineal line, and the main vessels together with any associated vascular anomalies. If the patient is placed in a moderate Trendelenburg tilt it allows almost any form of repair to be carried out with the utmost ease. Because the inguinal canal is not disturbed there is no tendency to post-operative direct inguinal hernia, and the technique can be used without prejudice to, or embarrassment from, a previous inguinal repair.—I am, etc.,

Barnet, Herts. V. J. DOWNIE.

REFERENCE

1 *Ann. roy. Coll. Surg. Engl.*, 1950, 7, 484.

"Et all., etcc."

SIR,—Dr. A. J. Jex-Blake (October 4, p. 780) would have you print "*et all.*" to indicate more than one collaborator of a named author, reserving the familiar "*et al.*" for only one co-author. But if there is only one, he should be named, the only justification for "*et al.*" being that the number of joint authors is so great as to render cumbersome the naming of each at every citation of the reference. The first citation and the reference list should normally give the names of all the authors.

Dr. Jex-Blake's argument, if extended, might introduce other unfamiliar conventions, including possibly "etcc." in place of "etc." If *et al.* is to be discarded, it should be in favour of "and others," which would be welcome to the printers, who must surely be tried by our too frequent demands for italics.—I am, etc.,

Glasgow. J. W. HOWIE.

POINTS FROM LETTERS

Wrapping the Journal

Mr. T. H. MOLESWORTH (St. Margaret's Bay, Kent) writes: I was amazed to read Dr. A. Wesley Hill's letter (October 4, p. 780) on wrapping the *Journal*, with which I wholly disagree. If it is to be an economy, do away with the zip. Economy, however small, should be encouraged. If a doctor does not care to spend a few seconds to open the *Journal*, then he cannot value economy—or the *Journal*.

Dr. A. E. STEVENS (Jersey, C.I.) writes: For a long time now, when I have wanted to know about the latest fashion in antibiotics, what the backroom boys are discovering about the gangliform enlargement on the nerve to the teres minor, or how much further down the Gadarene slope our ancient profession has slipped, I have used an old safety-razor blade—single-edged preferred—to open the *Journal*. If this is run down the wrapper delicately, and in line with the exposed edges, the cover is cleanly removed.

Obituary

H. T. ASHBY, M.D., F.R.C.P.

Dr. H. T. Ashby, physician to the Royal Manchester Children's Hospital, died in Manchester on October 9 at the age of 72. For nearly 70 years the name of Ashby has been closely associated with the Manchester Children's Hospital, for Dr. H. T. Ashby's father, Henry Ashby, was appointed to the visiting staff in 1878 (when the hospital was known as the Pendlebury Hospital), and he served it with ceaseless devotion until his death in 1908.

Hugh Tuke Ashby was born on September 16, 1880, and was educated at Clifton College, Cambridge University, and Manchester Royal Infirmary, where after qualification in 1907 he became house-surgeon to Professor F. A. Southam. In the following year he graduated M.B., B.Ch. and took the M.R.C.P. He proceeded M.D. in 1913 and was elected F.R.C.P. in 1924. After leaving the Royal Infirmary Ashby became resident medical officer at Pendlebury Hospital, and so began his career as a paediatrician. He left Pendlebury for a time to study paediatrics at Marburg, in Germany, and later at New York, Boston, and Philadelphia. On his return to this country he became senior medical officer to the out-patients department of the hospital, a position he held for two and a half years, and in 1912 he was elected to the staff as assistant visiting physician. He was also elected honorary assistant physician to Salford Royal Hospital, where he had beds for adult patients in addition to those for children.

From the first day of his appointment Ashby served his hospitals with constant zeal and eagerness, earning for himself the affection of his colleagues and patients. He was a very regular attender at the meetings of the board of governors and the medical board of Pendlebury Hospital, and his opinion and advice were greatly valued. When he retired from the active staff a ward in the hospital was named the Ashby ward to commemorate the long and valuable service that he, following in the footsteps of his father, had rendered to the hospital. Without seeking the limelight Ashby never spared himself in his endeavour to make life easier and happier for others, although he was handicapped by a lifelong physical disability. He was particularly interested in the welfare of the nurses, and after his retirement he continued to act as their physician, paying regular visits to the hospital each week for this purpose.

He did not make many contributions to medical literature or undertake much research, but his sound judgment and clinical experience were of great help to his colleagues and to the students of the University of Manchester, where he held the post of lecturer in diseases of children. In addition to his appointments at Pendlebury Hospital and Salford Royal Hospital, he was consultant physician to the Manchester Municipal Hospital for Children at Booth Hall, and consulting physician to the Princess Christian College, Manchester. Ashby was one of the original members of the British Paediatric Association, of which he was elected president in 1949, an honour which gave him and all his colleagues and friends great pleasure. In the following year he succeeded the late Dr. Catherine Chisholm as president of the recently formed Manchester Paediatric Club. He had a grand sense of humour and no enemies. His death will be felt severely by a large number of friends, to whom, and to countless children and their parents, his memory will be very dear. He married the niece of the late Sir Grafton Elliot Smith, the well-known anthropologist and anatomist, and she survives him with a son, who is in the legal profession, and two daughters. —J. F. W.

Dr. James Cowan Woods, who died in London on September 24 at the age of 76, after a long illness, was born on March 17, 1876, and was educated at the Royal School, Dungannon, Northern Ireland. From an early age he wished to take up medicine as a career, but for a while that was impossible for financial reasons. He first became, therefore, a schoolmaster, and in 1902 he obtained an honours degree in history at the Royal University of Ireland, being awarded an exhibition. Eventually he entered the London Hospital as a medical student, and qualified M.R.C.S., L.R.C.P. in 1909. Two years later he obtained the degrees of M.B., B.S. of the University of London, proceeding M.D. in 1914 and winning the gold medal in psychiatry. In 1917 he was awarded the Gaskell gold medal and prize by the Royal Medico-Psychological Association. He was for many years lecturer in mental diseases in the London Hospital Medical College and at St. George's Hospital. For his work while in charge of the special hospital for officers at Palace Green during the war of 1914–18 he was awarded the O.B.E. Caring little for sport in general, he was an enthusiastic follower and most capable exponent of boxing. Though never more than a lightweight he successfully represented London Hospital on at least one occasion in the middleweight division of the inter-hospitals competitions. A bachelor, of a singularly diffident and retiring nature, he devoted himself almost exclusively to the conduct of a large consulting practice until the onset of his last illness in April, 1949, forced him to retire from active work.—H. D.

We record with regret the death of Dr. John Lawrie at his home in Edinburgh on September 26 at the age of 80. Dr. Lawrie was born on March 13, 1872, and was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1894 at the age of 22. He then spent two years in hospital appointments before settling at Kilmarnock, where he rapidly established a busy general practice. At the same time he took great interest in hospital work, and in those days of general-practitioner specialists he was able to develop his undoubted flair for surgery. In 1908 he moved to Woking, in Surrey, where he spent his most productive years. The pressure of work from a large general practice did not prevent him from giving much of his time to the local hospital, which he served as surgeon for 17 years. He was also active in other aspects of the medical development of Woking, and in 1913 was instrumental in establishing the Woking Health Society, which had as its object the provision of medical and social care, including maternity and child welfare, and district nursing. His progressive mind perceived the need for maternity beds, and, as a result of his personal efforts and through the high regard of local residents for his views, guarantors were found and a small maternity home was established in 1918. As chairman of the Woking Health Society Dr. Lawrie directed the fortunes of the institution through the financial uncertainties and difficulties of its early years, when few patients would agree to enter hospital for a confinement. In spite of disappointments he never lost his confidence in the venture, and from that small beginning the present Woking Maternity Hospital emerged. Other activities of the original Health Society are now transferred to the local health authority, but Dr. Lawrie deserves credit as the pioneer spirit who foresaw the needs and provided the services that are now regarded as essential. Working at great pressure during the war of 1914–18, he began to suffer in health, and in 1923 he retired from practice, although he continued to serve as chairman of the committee of the maternity hospital until he finally left the district to return to Edinburgh in 1946. Dr. Lawrie represented a grand type of practitioner, and

his devotion to his patients brought him the usual recognition given to a popular doctor, but he had also a wide circle of personal friends who appreciated his vitality and his Scottish humour. He married in 1898 Louise Kennedy, of Edinburgh, who survives him with their five children.—L. H.

Dr. John Glen Wardrop, who died at Leamington on August 30 at the age of 63, received his medical education at University College Hospital, London, and qualified M.R.C.S., L.R.C.P. in 1913. During the war of 1914–18 he saw service in the Dardanelles as a temporary surgeon in the Royal Navy. After the war he was appointed house-physician and later resident medical officer at University College Hospital. He graduated M.B., B.S., with honours, in 1918, and proceeded M.D. three years later. In 1922 he settled in practice at Leamington, where he became first honorary assistant physician and later full physician to the Warneford General Hospital. On his retirement in 1946 he was elected consulting physician in recognition of his valuable services to the hospital. His opinion and practical help were much sought after, and he held several honorary appointments, among which were those of physician to the Church of England Children's Society's Home for Boys and Girls and the Sunshine Home for Blind Babies, both at Leamington.

Dr. Frank Clayton writes: There are many who could vouch for John Wardrop's success in practice. His decisive manner begot confidence, and there was always that feeling of certainty that everything was being done for the relief of the sufferer. Naturally abrupt, he did not show the conventional bedside manner, but his innate kindliness was transparent and revealed a consuming desire for his patients' good. To his colleagues he was forthright and loyal. His early medical training having taken place in more deliberate times, he was cautious in accepting the results of—to him—unproved pathology or therapeutics, but, once convinced, he was wholehearted in their application. He possessed high artistic standards, and was a water-colour artist of considerable ability. He gave up practice at the beginning of this year, and was enjoying the opportunities of retirement, when the end came with unexpected suddenness. He married Dr. Muriel Sutton, who was also a student at University College Hospital, and she and their two sons survive him.

By the death of Mr. P. P. Wright on September 18 the Mater Infirmorum Hospital, Belfast, has lost its senior surgeon and the people of Northern Ireland a distinguished surgeon and a valued friend. Mr. Peter Paul Wright was a native of Portadown, and was educated at St. Mary's College, Dundalk, and at Queen's University, Belfast, where he graduated M.B., B.Ch. in 1914. He entered the R.A.M.C. soon after graduation, and served in the war of 1914–18. In 1919 he proceeded M.D., and in the same year he took the D.P.H. of the University of Liverpool. After holding an appointment at the West Derby Union Infirmary, Liverpool, where he was also a demonstrator of anatomy at the university, he obtained the F.R.C.S.Ed. in 1921 and then joined the staff of the Mater Infirmorum Hospital, Belfast, to which he remained faithful until his death. He served on the board of management of the hospital and also as examiner to Queen's University. In disposition he was very reserved and studious, his main interests being everything that had any bearing on his work. As a consequence he always kept himself in the forefront of surgical knowledge. He had little time for meetings or committees, very rarely expressing his views publicly. Being singularly deft and skilful in his work, he had remarkable success with his cases. Some years ago he was attacked by a disease which he knew would eventually prove fatal, but he remained in harness with silent courage, often in much pain and daily growing weaker. He continued operating, doing his ward rounds, attending his out-patients, and teaching students till a sudden haemorrhage proved fatal. All who knew him will mourn his death. Mr. Wright was a widower, and he is survived by a son, who recently qualified in medicine, and a daughter, who is still a student.—E. M. H.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **September 27** (No. 39) and corresponding week 1951.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	15	4	2	1	1	25	2	15	1	1
Dysentery	123	44	66	2	2	144	50	64	0	
Encephalitis, acute	3	2	0	0		23	2	0	0	1
Enteric fever:										
Typhoid	3	0	0	0	1	5	1	3	0	1
Paratyphoid	31	1	0	0		33	0	2 (B)	4	
Food-poisoning	137	17		1		89	14		4	
Infective enteritis or diarrhoea under 2 years				21	35				22	48
Measles*	3,272	354	72	20	27	1,258	18	128	134	67
Meningococcal infection	21	2	14	0	1	23	3	12	2	
Ophthalmia neonatorum	44	5	3	0		52	2	8	0	1
Pneumonia†	316	22	181	3		258	22	121	3	
Poliomyelitis, acute:										
Paralytic	104	5	11	10	4	64	4	18	6	1
Non-paralytic	57	4				44	2			
Puerperal fever§	249	38	14	0		278	46	15	0	1
Scarlet fever	1,164	129	242	17	75	741	73	210	18	34
Tuberculosis:										
Respiratory			133	30				141	24	
Non-respiratory			11	3				21	7	
Whooping-cough	1,258	81	66	24	57	1,769	90	236	50	50

DEATHS in Great Towns	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0		0	0	*0*	0	*0*	0	0
Dysentery	0	0		0			0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	1	0		0		*0*	0	*0*	0	
Infective enteritis or diarrhoea under 2 years	7	0	1	1	2	*12*		*1*	0	0
Influenza	2	0		0	0	*5*	1	*0*	0	0
Measles		0		0	0		0	*0*	0	0
Meningococcal infection		0					2	*0*		
Pneumonia	161	22		10	2	*107*	17		7	3
Poliomyelitis, acute	6	0			0	*1*	0			0
Scarlet fever		0		0	0		0	*0*	0	0
Tuberculosis:										
Respiratory	66	11	13	3	6	*119*	13	*8*	4	8
Non-respiratory		0	1	0	1		7	*8*	0	1
Whooping-cough	3	0		1	0	*1*	0	*1*	0	0
Deaths 0–1 year	216	30	25	9	14	*193*	26	*29*	3	17
Deaths (excluding stillbirths)	4,635	674	522	103	159	*4,170*	669	*531*	93	136
LIVE BIRTHS	7,621	1161	810	254	431	*6,827*	1092	*811*	243	416
STILLBIRTHS	201	22	28			*153*	20	*29*		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

Infectious Diseases

In England and Wales during the week ending September 27 the number of notifications increased for measles 682 and scarlet fever 312 and decreased for whooping-cough 108 and acute poliomyelitis 27.

The largest increases in the incidence of measles were Yorkshire West Riding 141, Lancashire 108, and London 82. The largest rises in the notifications of scarlet fever were London 69 and Lancashire 51. Only small variations occurred in the local trends of whooping-cough. The number of notifications of diphtheria was the lowest ever recorded; it was 6 less than in the preceding week.

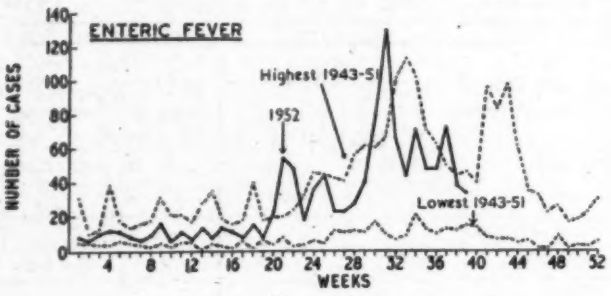
There were 2 fewer notifications of paratyphoid fever than in the previous week. Of the 31 cases, 18 were notified in Wales, where the largest centres of infection were Glamorganshire 10 (Maesteg U.D. 6) and Monmouthshire 5.

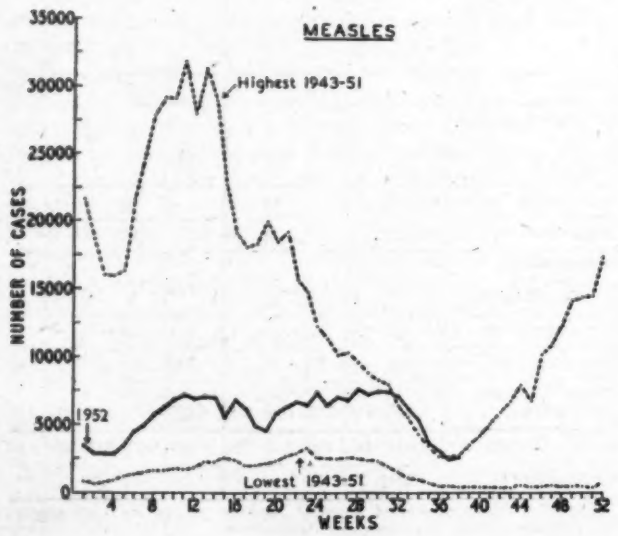
Notifications of acute poliomyelitis were 23 fewer for paralytic and 4 fewer for non-paralytic cases than in the preceding week. The largest returns were Essex 19 (Southend-on-Sea C.B. 12); Yorkshire West Riding 14 (Leeds C.B. 5); Kent 11; Middlesex 11.

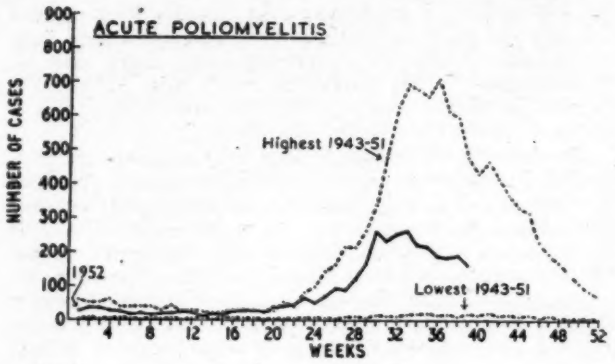
The largest centres of dysentery were Lancashire 30 (Whiston R.D. 12, Blackburn R.D. 9); London 17; Middlesex 17.

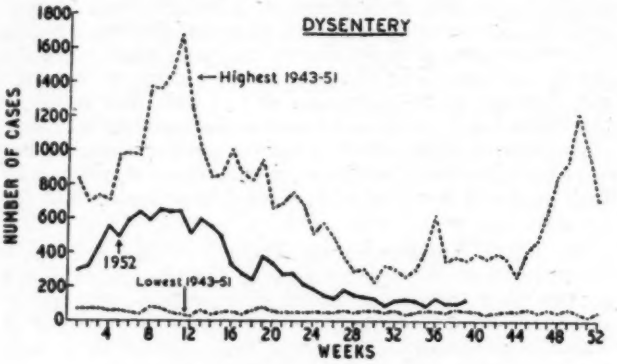
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1943–51 are shown thus - - - - - - -, the figures for 1952 thus ————. Except for the curves showing notifications in 1952, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Quarterly Returns for Scotland

The birth rate during the second quarter of 1952 was 18.5 per 1,000 of the population, being 0.6 below the rate for the June quarter of 1951 and 1.9 below the average of the five preceding second quarters. The percentage of illegitimate births was 4.8, which was 0.9 below the average of the five preceding June quarters. The infant mortality rate was 34 per 1,000 registered live births, being 1 less than the rate for the corresponding quarter of 1951. Stillbirths formed 25 per 1,000 of the total births, and this was the lowest rate ever recorded in any quarter.

The general death rate was 11.2 per 1,000 of the population, which was 0.6 below the average of the five preceding second quarters. Deaths attributed to the principal epidemic diseases numbered 97. There were 75 from influenza, 9 from measles, 9 from meningococcal infections, and 4 from whooping-cough. 319 deaths were ascribed to tuberculosis of the respiratory system and 58 to other forms of tuberculosis. These were equivalent to death rates of 25 and 5 per 100,000 respectively, and were 31 and 6 below the average rate for the five preceding second quarters.

Week Ending October 4

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,284, whooping-cough 1,126, diphtheria 25, measles 4,696, acute poliomyelitis 155, dysentery 192, paratyphoid fever 23, and typhoid fever 4.

Universities and Colleges

UNIVERSITY OF OXFORD

Professor T. Pomfret Kilner, Nuffield professor of plastic surgery in the University, has been appointed to carry on the duties of the Nuffield professorship of surgery during Michaelmas term, 1952.

The Theodore Williams Scholarship in Anatomy for 1952 has been awarded to James Griffith Edwards (Balliol College).

UNIVERSITY OF DURHAM

In Congregation on September 27 the degrees of M.B., B.S. were conferred on K. S. Dawes.

Medical News

British Surgical Research.—An excellent display of new apparatus, models, and photographs illustrating current research in surgery was put on by the Royal College of Surgeons after dinner on October 8. The showpiece of the evening was a machine for taking over the whole or part of the human circulation. Designed at the Buckston Browne Farm, it consists in a pump for extracting blood from the venous and returning it to the arterial circulation, and a cylindrical oxygenator containing a line of plates across which the blood falls, receiving the oxygen on the way. The apparatus also incorporates a circuit by which extra blood may be added. It has been used experimentally on dogs, and its designers are now ready to try it on man. Cases of cor pulmonale and coronary thrombosis are thought to be the most suitable to begin with. Among the other exhibits was a film showing with remarkable clarity the action of the human heart valves in prepared specimens. In another room photographs and slides illustrated experiments on the heterologous transplantation of tumours—for example, of prostatic carcinoma from man to mouse. Incidentally, post-mortem study of patients dying from diseases other than prostatic cancer had shown a remarkably high percentage of cases in which prostatic cancer was present though unsuspected—up to 40% in the aged. Another attractive exhibit translated the impulses from the muscles of mastication into waves on a cathode-ray screen, showing the effect of various muscles concerned in jaw movement. Elsewhere photomicrographs and slides showed how the contents of the neurilemma comprise two immiscible fluids; crushing causes them to emulsify, but they separate again to show the same histological appearances as before. All told, the exhibition was a diverting and instructive illustration of the latest ideas by which surgery is being advanced in the various departments of the College.

Rockefeller Grant for G.P. Teaching Unit.—The University of Edinburgh has received a grant of £25,000 from the Rockefeller Foundation for the purpose of developing its general-practice teaching unit. The unit, which is directed by Dr. Richard Scott, has been created by the Faculty of Medicine for the purpose of training senior medical students in general practice. It is a modern development of the dispensary training which has been a feature of the Edinburgh medical school for over 150 years.

Postgraduate Travelling Fellowships.—The British Postgraduate Medical Federation is offering a limited number of postgraduate travelling fellowships to registered medical and dental practitioners. The fellowships are tenable for one year and are intended for practitioners who are training as specialists in one of the clinical or pre-clinical branches of medicine, surgery, or dentistry. Further details are given on p. 39 of the advertisement pages.

Kathleen Schlesinger Fellowship.—The Medical Research Council invites applications for this whole-time fellowship for research on the nature of cysts of the brain or cognate subject. Preference will be given to candidates electing to work on the mechanisms underlying degenerative processes affecting the brain. The fellowship is normally held at the National Hospital for Diseases of the Nervous System, Queen Square, London, and is worth £700 to £1,000, according to qualifications and experience. The last day for applications is November 15. Further details may be obtained from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1.

Sims Commonwealth Professors.—Sir Charles Symonds and Professor Harold Drew have been appointed Sir Arthur Sims Commonwealth travelling professors for 1953. Sir Charles Symonds is neurologist to Guy's Hospital. Professor Drew is professor of surgery in the University of Sydney.

Agricultural Research Council.—Among the new members of the Agricultural Research Council are Professor P. B. Medawar, F.R.S., Jodrell professor of zoology and comparative anatomy at London University, and Professor J. S. Young, professor of pathology at Aberdeen University. Professor G. R. Cameron, F.R.S., professor of morbid anatomy at London University, has been reappointed for a further term.

Terramycin.—The Ministry of Health announces that a limited supply of 20-mg. phials of pure terramycin for sensitivity tests will shortly be available to hospital laboratories. Supplies may be obtained from the regional distribution centres from which terramycin is now provided.

Grenfell Association Christmas Cards.—Once again the Grenfell Association is offering Christmas cards for sale, all proceeds from which will be devoted to the maintenance and furtherance of the Grenfell Mission's medical work in Labrador and Northern Newfoundland. An illustrated leaflet giving details of cards available (ranging in price from 3d. to 1s. 3d.) may be obtained from the association office, 66, Victoria Street, London, S.W.1, on receipt of 1½d.

Dr. E. D. Adrian, O.M., Master of Trinity College, Cambridge, is a member of the reconstituted General Advisory Council of the B.B.C.

Mr. W. J. Wellwood Ferguson, ophthalmic surgeon to the Royal Infirmary, Sheffield, has been made president of the Illuminating Engineering Society for the 1952–3 session.

Bequests.—Mr. John William Wootton, of Far Headingley, Leeds, formerly honorary financial secretary of the Yorkshire Council of the British Empire Cancer Campaign, left £2,000 to that body. Other legacies include £2,000 each to Leeds General Infirmary, Leeds Public Dispensary and Hospital, and Harrogate Royal Bath Hospital; £1,000 to the Christie Hospital and Holt Radium Institute, Manchester; £750 to Leeds Women's Hospitals; £500 to the Imperial Cancer Research Fund; and a portion of the residue to the Marguerite Hepton Memorial Orthopaedic Hospital.

COMING EVENTS

Apothecaries' Lectures.—The Society of Apothecaries of London has arranged a course of eight postgraduate lectures to be delivered in the Apothecaries' Hall, Black Friars Lane, London, E.C.4, as follows: *November 3*, 3.30 p.m., Surgery of Diseases of the Chest (T. Holmes Sellors); 5 p.m., The Medical Aspect of Diseases of the Chest (Sir Geoffrey Todd); *November 4*, 3.30 p.m., Changes in Obstetrics and Gynaecological Practice in the Last 50 Years (Sir William Gilliatt); 5 p.m., Pitfalls in Diagnosis of Coronary Thrombosis (Dr. Kenneth Harris); *November 5*, 3.30 p.m., Some Medical Aspects of Hypertensive Disease (Sir Horace Evans); 5 p.m., A Review of Surgical Management of Hypertension (A. Dickson Wright); *November 6*, 3.30 p.m., Medico-legal Hazards in General Practice (Dr. Robert Forbes); 5 p.m., Present and Future Trends in General Practice (Dr. R. Hale-White).

Ophthalmological Society.—The annual congress of the Ophthalmological Society will be held from April 23–25, 1953. The presidential address will be delivered by Mr. Alex. MacRae. The subject for discussion will be "The Scope of Antibiotics and Chemotherapeutic Agents in Ophthalmology." This will be opened by Professor Arnold Sorsby, Professor Robert Cruickshank, and Mr. Derek Ainslie. The Bowman Lecture will be delivered by Professor Sir Geoffrey Jefferson. Members wishing to present a paper (or a film) are asked to send the title and an abstract to the hon. secretary, Mr. A. G. Leigh, 45, Lincoln's Inn Fields, W.C.2, from whom further details can be obtained.

International Radiology Congress.—The Seventh International Congress of Radiology will be held in Copenhagen from July 19 to 25, 1953, under the patronage of King

Frederik IX of Denmark. The scientific programme will comprise general meetings on potential developments in radiology, contrast media in diagnosis and risks associated therewith, radio-resistance, protection against ionizing radiations, and uniformity in therapeutic cancer statistics. There will also be sectional symposia on diagnosis, therapy, biology, physics, and technology. The honorary president of the Congress will be Professor Niels Bohr, and the president Professor P. Flemming Møller. Applications to present a paper or film should reach the Congress office not later than January 1, 1953. Special forms for this purpose, together with further information, can be obtained from the secretary-general, Oster Voldgade 10, Copenhagen K.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, October 20

●Hunterian Society.—At Talbot Restaurant, London Wall, E.C., 7 for 7.30 p.m., first dinner meeting. *"Cardiology—Old and New,"* Presidential Address by Dr. B. Parsons-Smith.

●Institute of Child Health, Hospital for Sick Children, Great Ormond Street, London, W.C.—5.30 p.m., *"Inborn Errors of Metabolism in Animal and Child,"* by Dr. L. I. Woolf.

Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—3.45 p.m., *"The Breast,"* Erasmus Wilson Demonstration by Mr. P. H. Mitchiner.

University College, Physiology Theatre, Gower Street, London, W.C.—4.45 p.m., *"Ionization and Biological Activity,"* by Professor Adrien Albert (Australian National University).

Tuesday, October 21

British Postgraduate Medical Federation.—At London School of Hygiene and Tropical Medicine, Keppel Street, W.C., 5.30 p.m., *"Control of Respiration,"* by Professor C. G. Douglas, F.R.S.

Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—3.45 p.m., *"Blood Vascular Diseases,"* Erasmus Wilson Demonstration by Mr. L. W. Proger; 5 p.m., *"Acute Post-operative Dilatation of the Stomach,"* Hunterian Lecture by Professor K. W. Starr.

Society for the Study of Addiction.—At Medical Society of London, 11, Chandos Street, Cavendish Square, W., 8 p.m., *"The Possibilities of Apomorphine in the Treatment of Drug Addiction,"* by Dr. J. Y. Dent; *"The Reading Preferences of the Drinking and Smoking Population Examined in the Light of the Hulton Readership Survey,"* by Dr. H. Pullar-Strecker. Discussion.

South-west London Medical Society.—At Bolingbroke Hospital, Wandsworth Common, S.W., 8.30 p.m., *"Sport Injuries: Their Diagnosis and Treatment,"* by Sir Arthur Porritt.

Wednesday, October 22

Christian Medical Fellowship.—At Royal Empire Society, Northumberland Avenue, London, W.C., 7.45 for 8.15 p.m., *"The Doctor: Has He a Faith?"* by Sir Henry T. Holland.

●Institute of Obstetrics and Gynaecology.—At Hammersmith Hospital, Ducane Road, London, W., 3 p.m., *"Post-operative Care Following Ultra Radical Surgery,"* Guest Lecture by Professor Ian Aird.

London County Medical Society.—At Western Fever Hospital, S.W., 3 p.m., clinical meeting.

Midland Medical Society.—8.15 p.m., annual dinner and inaugural meeting. *"American Medicine To-day,"* by Sir Allen Daley.

Royal Eye Hospital, St. George's Circus, Southwark, London, S.E.—5.30 p.m., *"The Ocular Complications of Head Injury,"* by Mr. R. P. Crick.

Thursday, October 23

British Postgraduate Medical Federation.—At London School of Hygiene and Tropical Medicine, Keppel Street, W.C., 5.30 p.m., *"Metal Catalysis and Intracellular Respiration,"* by Professor D. Keilin, F.R.S.

Epsom and Sutton Inter-Hospital Psychiatric Association.—At Banstead Hospital, Sutton, Surrey, 8 p.m., papers and clinical demonstrations, preceded by election of officers for 1952-3.

Honyman Gillespie Lecture.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, 5 p.m., *"A Review of the Radiographic Features of Some General Affections of the Skeleton,"* by Dr. W. S. Shearer.

Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—5 p.m., *"High Ligation of the Neck and the Sac in Inguinal Hernia."* Arris and Gale Lecture by Mr. H. F. Lunn.

St. Andrews University.—At Lecture Theatre, Materia Medica Department, Medical School, Small's Wynd, Dundee, 5 p.m., *"The Mode of Growth of Bones,"* by Professor J. C. Brash.

University College, Anatomy Theatre, Gower Street, London, W.C.—5.30 p.m., *"The Prodromes to Cortical Localization,"* Rickman Godlee Lecture by Sir Geoffrey Jefferson, F.R.S.

Friday, October 24

Biochemical Society.—At Department of Biochemistry, St. Thomas's Hospital Medical School, London, S.E., 2 p.m., 311th meeting. Scientific papers will be read.

London Association of the Medical Women's Federation.—At Royal Free Hospital School of Medicine, 8, Hunter Street, Brunswick Square, W.C., 8.30 p.m., *"Organization of the Law,"* by the Hon. Mr. Justice McNair.

Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—5 p.m., *"The Reconstruction of the Hand in Leprosy,"* Hunterian Lecture by Professor P. W. Brand.

Royal Medical Society, 7, Melbourne Place, Edinburgh.—8 p.m., *"The Electrical Theories of Nerve Conductivity,"* by Mr. B. I. Tyson.

APPOINTMENTS

South-west Metropolitan Regional Hospital Board.—*Consultant Radiologist (part-time) Western Area Thoracic Surgery Unit*, R. B. Boal, M.B., B.Ch., D.M.R.E. *Assistant Pathologist (S.H.M.O., whole-time), Portsmouth and I.O.W. Area Pathological Service*, I. L. M. Larkin, M.D. *Assistant Pathologist (S.H.M.O., whole-time), Wandsworth Hospitals Group Laboratory*, P. W. Kippax, M.B., Ch.B. *Assistant Psychiatrist (S.H.M.O., whole-time), Banstead Hospital*, R. H. Wheeler, M.B., B.Ch., M.R.C.P., D.P.M. *Assistant Psychiatrist (S.H.M.O., whole-time), St. James' Hospital, Portsmouth*, Gwendoline D. Knight, M.R.C.S., L.R.C.P., D.P.M. *Psychiatric Registrars, Banstead Hospital*, Marie L. S. Beasley, B.M., B.Ch., and I. F. Collie, M.R.C.S., L.R.C.P. *Medical Registrar, Poole General and St. Mary's Hospitals, Poole*, R. P. Brooks, M.B., Ch.B., M.R.C.P.Ed. *Surgical Registrar, Salisbury General Hospital*, J. M. Jalundhwala, M.B., B.S., F.R.C.S. *Surgical Registrar, Lambeth Hospital*, E. G. Brewin, M.B., Ch.B. *Pathological Registrar, St. Peter's Hospital, Chertsey*, Jutta Singer, M.R.C.S., L.R.C.P. *Pathological Registrar, Kingston Group Laboratory*, J. T. Cecil, M.B., B.S. *Anaesthetic Registrar, Southampton General Hospital*, A. L. St. A. McClosky, M.R.C.S., L.R.C.P., D.P.H., D.A. *Anaesthetic Registrar, Chichester Group*, J. J. F. Donworth, M.B., B.Ch. *Anaesthetic Registrar, Fulham and Kensington Group*, L. Havers, M.D. *Plastic Surgical Registrar, Odstock Hospital*, M. N. Tempest, M.B., Ch.B., F.R.C.S.Ed. *Medical Registrar, St. Mary's, Portsmouth*, J. McK. N. Roberts, M.B., B.S. *Medical Registrar, Redhill County Hospital*, K. J. O'Connor, M.B., Ch.B. *Senior Surgical Registrar, Royal Victoria Hospital, Boscombe*, J. H. E. Verdon, M.B., B.S., F.R.C.S. *Surgical Registrar, Putney Hospital*, D. I. Stirk, F.R.C.S. *Senior Orthopaedic Registrar, Rowley Bristow and St. Peter's (Chertsey) Hospitals*, D. R. Urquhart, M.B., B.S., F.R.C.S. *Orthopaedic Registrar, St. Peter's, Chertsey*, P. R. French, M.R.C.S., L.R.C.P. *Psychiatric Registrar, Graylingwell Hospital*, D. R. Moore, M.B., B.S.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bruce.—On September 26, 1952, to Joyce, wife of Dr. I. Bruce, 613, Chorley Old Road, Bolton, a son.

Henderson.—On October 9, 1952, at Meadstead House, Royston, near Barnsley, Yorks, to Winifred (formerly Hale), wife of Dr. James Henderson, a daughter.

Henry.—On September 21, 1952, at British Military Hospital, Graz, Austria, to Hilda (formerly Loble), wife of Captain E. R. Henry, R.A.M.C., a daughter—Caroline Jane.

Hirst.—On October 7, 1952, to Dr. Stella Armitage (formerly Speight), wife of Dr. John Hirst, a daughter.

Thomas.—On October 2, 1952, to Joyce (formerly Nicholas), wife of Dr. G. H. Thomas, of Walsall, a sister for Elizabeth Linda.

Wilkinson.—On September 13, 1952, at Queen Elizabeth Hospital, Birmingham, to June (formerly Tolley), wife of Dr. Ian Wilkinson, a daughter—Caroline Jane.

MARRIAGES

Lerse—Hamilton.—On September 20, 1952, at Harrogate, Albert Lerse to Margaret Hamilton, M.B., Ch.B., D.A.

DEATHS

Andrew.—On October 8, 1952, at Trevinnick, Bodmin Road, St. Austell, Cornwall, Edwyn Gaved Andrew, M.D.

Cogswell.—On October 12, 1952, at Red Roofs, Sidmouth, Devon, Philip Dare Cogswell, M.R.C.S., L.R.C.P., late of Bromley, Kent.

Coombes.—On October 7, 1952, at Croft Cottage, Horsebridge, Sussex, Percival Charles Coombes, M.R.C.S., L.R.C.P.

Finny.—On October 10, 1952, at his home, 41, Liverpool Road, Kingston Hill, Surrey, William Evelyn St. Lawrence-Finny, M.D., M.Ch., J.P., aged 88.

Hobbs.—On October 8, 1952, at Benghazi, Anthony Arthur Hobbs, M.R.C.S., L.R.C.P., Captain R.A.M.C., of Cheam, Surrey, aged 26.

Lawson.—On October 8, 1952, at 12, Ovington Court, London, S.W., Frederick James Lawson, M.B.

Lindsay.—On October 3, 1952, at "Shortfurrows," Whyteleafe Road, Caterham, Surrey, Thomas Lindsay, M.D., F.R.C.S.Ed., D.P.M.

McCracken.—On October 7, 1952, at 10, Castelnau, Barnes, London, S.W., Alastair McCracken, M.B., Ch.B.

Matthews.—On October 3, 1952, Edgar William Matthews, T.D., M.B., B.S., D.P.H., of "Oakingham," Bramber Road, Seaford, Sussex, aged 72.

Milne.—On October 2, 1952, at 40, Valley Road, Scarborough, Yorks, William Stuart Milne, M.B., Ch.B.

Proudlock-Dunbar.—On October 6, 1952, Gladys Margaret Campbell Proudlock-Dunbar (formerly Dunbar), M.D., J.P., of Royston, Herts.

Riches.—On October 2, 1952, at Brook House, Apperley Bridge, Bradford, Yorks, John Frith Riches, M.R.C.S., L.R.C.P., aged 49.

Townsend.—On October 5, 1952, at the Eye Hospital, Cork, Thomas Henry Denny Townsend, M.B., B.Ch., of 14, St. Patrick's Hill, and Merton, Queenstown, Cork.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Role of Streptococci in Rheumatic Fever

Q.—*What is the current view of the role of streptococci in the causation of rheumatic fever?*

A.—The current view of rheumatic fever is that it is one of the complications of upper respiratory tract infection by Group A β haemolytic streptococcus, although there is little evidence that streptococci are directly responsible for the individual lesions. Other groups of streptococci do not seem to be associated with rheumatic fever: infection elsewhere than in the throat produces rheumatic fever seldom, if ever. The evidence for this view is the frequent history of preceding sore throat, the fact that streptococci can often be cultured from the throat at onset, and the fact that epidemics of rheumatic fever invariably follow epidemics of sore throats due to Group A haemolytic streptococcus. Even more important as evidence is the demonstration of a rise in the titre of antistreptolysin O in 80% of cases. In most of the remaining 20% some rise in antistreptococcal antibody (anti-hyaluronidase, anti-fibrinolysin, anti-desoxyribonuclease) is seen. Rheumatic fever is not due to any particular type of Group A streptococcus, but may be due either to substances elaborated by the streptococcus or to the immune response engendered thereby. Streptococcal infection is not, however, the sole factor, since this is common and rheumatic fever is rare: heredity and environmental factors have been incriminated. It seems possible that the association with poverty may be due to the increased opportunity of repeated streptococcal infection with overcrowding.

Antidotes for Antihistamines

Q.—*What treatment is advised in acute poisoning with an antihistaminic drug? Is there any specific antidote?*

A.—The treatment of poisoning by antihistaminic drugs has not yet been established. In moderate intoxication, when the main symptom is drowsiness, respiratory stimulants such as caffeine or amphetamine are indicated. When severe intoxication and convulsions are present, sedatives such as the barbiturates or chloral hydrate would probably be the choice. The use of histamine as an antidote has been suggested (Schwartzberg, S., and Willerson, D., *J. Amer. med. Ass.*, 1947, **133**, 393) and an editorial in the *Lancet* (1950, **1**, 28) states that "the obvious antidote is histamine acid phosphate, injected subcutaneously in doses of 0.1 mg. per kilogram of body weight," but the use of histamine in this respect has been inadequately explored. Whatever drugs are used, the stomach should be washed out as the preliminary treatment.

Black Hairy Tongue

Q.—*What are the causes, pathology, and treatment of a black hairy tongue?*

A.—The causes of black hairy tongue remain largely unknown, but it can be said with some certainty that the condition can be produced by local or systemic use of penicillin or the newer antibiotics. Until the results of more detailed investigation of the floral changes in the mouth after the use of these antibiotics are available we cannot go further than this. Histological examination shows that the affected papillae are enlarged; the pigmentary change is thought to be due to oxidation, although in certain cases pigments produced by the microflora cannot be ruled out. The condition, of course, is harmless and symptomless, and the unpleasant appearance is often the only reason why the patient persists in seeking treatment. Spontaneous recovery undoubtedly occurs, but treatment, as a rule, is not very effective. Some cases in which candida has been recovered from the lesion respond to gentian violet lozenges sucked three or four times daily. The most effective treatment known to the writer is daily painting with trichloracetic acid.

Inadequate Vaginal Secretion

Q.—*One of my patients, a young married woman who is perfectly normal in all respects, experiences a very scanty vaginal secretion on stimulation. The husband invariably has to use a lubricant in order to ensure entrance on sexual intercourse. Even long physical stimulation fails to bring about a sufficient vaginal lubrication to ensure a painless intercourse. The patient wishes to know if there is any remedy which will increase her vaginal secretion.*

A.—The data suggest that both husband and wife are well informed on technique, so ignorance and precipitancy on the part of the husband can probably be excluded. Congenital absence or underdevelopment of Bartholin's glands is a remote theoretical possibility. The most likely explanation of the failure of Bartholin's glands to secrete is hysterical anaesthesia of the external or internal genital organs, or some inhibition of nervous or emotional origin. The condition is closely allied to sexual frigidity and failure to achieve orgasm; it would be of interest to know if these symptoms are also present in this case. In most of these cases the condition improves with time, but there are some women who seem inherently incapable of developing full sexual feelings. If this couple are fairly recently married the outlook is probably good, and treatment should be by explanation and reassurance. They should continue using a non-greasy lubricant, such as surgical jelly, until matters improve.

Treatment with oestrogens is valueless unless there is clear evidence of ovarian underactivity such as amenorrhoea and genital hypoplasia or atrophy.

Rum Bee-keeper

Q.—*As an apiarist I have on several occasions come across cases of bee or wasp stings on the back of the neck which have caused a temporary but profound bradycardia accompanied by a big drop in blood pressure. In several victims I have spoken to it is only the stings on the back of the neck which have this particular effect, stings on other parts of the body not having any effect apart from the usual local symptoms. Is the effect brought about by the stimulation of the vagus by way of the superficial auricular branch by the neurotoxin liberated in the immediate neighbourhood of the sting? The picture is quite distinct from allergic response in the pre-sensitized subjects. It comes on in about 15–30 seconds and lasts for about half an hour, during which time the patient has to lie down, any attempt at standing or sitting up causing faintness. One friend of mine avers that a neat double rum taken immediately on being stung on the neck will largely prevent these symptoms developing. Presumably this large dose of alcohol acts by counteracting the hypotensive effect of the vagal stimulation—or might it dull the sensitivity of the vagus to the toxin?*

A.—It is known and accepted that allergic reactions to injected substances can appear with lightning speed and that hypotension is a usual accompaniment. The writer has found bradycardia commonly in allergic reactions following pollen therapy and sees no reason why the reaction described could not be accepted as an allergic one. The understanding of reactions to bee stings is by no means entirely clear, for the response of an individual may vary from time to time, possibly owing to different sites of injection, while it is reported that different sites of the body may also vary in their degrees of reaction.

Iron in the Tropics

Q.—*What is the best iron mixture for use in the Tropics? A simple solution of ferrous sulphate in water is used widely here, but is said to oxidize rapidly to the unabsorbable ferric state. Would the addition of a reducing agent, such as glucose, be helpful, and, if so, in what strength? In replying, please have regard to the cost of the mixture recommended, and also state for how long it would remain therapeutically active.*

A.—The best iron mixture for use in the Tropics is iron and ammonium citrate, 2 g. (30 gr.) in 14 ml. (½ fl. oz.) of water. It is cheap and will remain therapeutically active indefinitely. The questioner is correct in his surmise that ferrous sulphate must not be prescribed in a simple watery solution, since oxidation rapidly occurs to the ferric state, which renders the mixture ineffective. He is also correct in believing that the addition of glucose, which retards oxidation, is helpful in this respect. The effect of the glucose is said to be enhanced by the addition of a trace of hypophosphorous acid. The following prescription will remain therapeutically active for at least a month and is not unduly expensive: ferrous sulphate, 0.3 g. (5 gr.); diluted hypophosphorous acid, 0.014 ml. (¼ min.); dextrose, 1 g. (15 gr.); and chloroform water, 3.5 ml. (1 fl. dr.). Ferrous sulphate in tablet form, 0.3 g. (5 gr.) three times a day, which keeps indefinitely and is very cheap, is, however, usually the best way to prescribe iron. It is more convenient than a mixture because the tablets are more portable and do not blacken the teeth. In addition, a small bottle containing 100 tablets will last a month, whereas equivalent treatment with a mixture will require the dispensing of a fresh bottle on several occasions.

Water-softeners and Dermatitis

Q.—*My son, aged 4½, has had an eczema of the face and hands for some three years. A medical member of our household has now developed a similar condition of the hands. He suggests that the lesions may be due to our ion-exchange water-softener. The onset of the child's lesions occurred within six months of the installation of the softener; those of the adult began after five months' residence in this house. Is this theory probable?*

A.—I know of no reported case of dermatitis due to softening of the water with an ion-exchange column, and I do not consider this a probable cause. Water, especially hard water, is very irritating to the eczematous skin, and I presume that the child's face is cleansed with cream or olive oil and not with soap and water. The dermatitis of the hands of the adult medical member of the household is much more likely to be due to contact with drugs, such as streptomycin or procaine, or antiseptics.

Chronic Adhesive Otitis

Q.—*Under what conditions does fibrosis of the middle ear develop? Does a single attack of acute otitis media ever produce it? How may it be recognized? What is the treatment?*

A.—The condition in which the middle ear is occupied by adhesions is usually known as chronic adhesive otitis. It is a much less common condition than was formerly supposed. It is, as a rule, the result of repeated attacks of otitis media with—or without—discharge. Bands or sheets of organized fibrous tissue impede the passage of sound from the tympanic membrane to the labyrinth, either by the adhesions impeding the movement of the ossicles or tympanic membrane, or sometimes by a sheet of adhesions forming over the round window and preventing the movement of the labyrinthine fluids in response to transmitted sound waves.

The condition is easily recognized by the abnormal appearance of the tympanic membrane; either this is thickened and opaque, or, if it retains its normal translucency, the adhesions may actually be seen through it. The fenestration operation has been advised in these cases, but the writer has had no success in the six patients with this complaint whom he has submitted to the operation. Repeated inflation of the middle ear through the Eustachian tube has also been advised, but without any great success. A valve-amplified hearing-aid, with air- or bone-conduction receiver, will usually enable the patient to hear speech in most circumstances.

Phlebitis and Elastic Stockings

Q.—*Is phlebitis a recognized complication of the use of elastic stockings (below the knee) with too tight an upper border in cases of varicose veins? Phlebitis developed two days after the use of such a stocking in a man who had previously worn elastic stockings for 40 years without ill-effect.*

A.—Phlebitis is not a recognized complication of the use of below-knee elastic stockings. A stocking with a too tight upper border, just as any other local constriction, might act as a precipitating factor, and this might well be the case if the constriction were tight enough to impede the local venous return. This causal relationship would be supported by the fact that the patient had worn elastic stockings for 40 years without previous ill-effect, especially if there had been no previous phlebitis or any other type of likely precipitating factor. Most cases of phlebitis in varicose veins develop spontaneously as a result of venous congestion in an exceptionally thin and poorly nourished vein. Local constrictions, local trauma, massage, prolonged sitting, or rest in bed for some intercurrent illness, etc., may occasionally be precipitating factors. Some caution is therefore necessary before attributing the phlebitis to the new stocking.

Sedatives for Babies

Q.—*What is the best sedative for a C.P. to carry in his bag for giving babies and young children to promote sleep? One is often called out during an evening to see a child fractious for a variety of reasons—teething, feeding difficulties, slight fever, mild coryza, etc.—and it is desirable to give some drug to ensure sleep.*

A.—Chloral hydrate is much the best sedative or hypnotic for babies and young children in doses of 0.12 g. (2 gr.) for an infant, 0.2 g. (3 gr.) for a child of 6 months, and up to 0.65 g. (10 gr.) for older children.

Remission of Disseminated Sclerosis in the Tropics

Q.—*Is there any truth in the statement that cases of disseminated sclerosis experience complete remission of symptoms when they go to live in the Tropics?*

A.—This statement is not accurate. It has probably arisen from the undoubted fact that disseminated sclerosis is a rare disease in the Tropics, especially in the indigenous inhabitants. Although uncommon, it does occasionally occur in Europeans living in tropical countries.

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